# The Boston Medical and Surgical Journal

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## Address.

### THE RELATION OF THE DOCTOR TO WORKMEN'S COMPENSATION.*

BY FRANCIS D. DONOGHUE, M.D., BOSTON,

*Medical Adviser of the Massachusetts Industrial Accident Board.*

IN the beginning, I would like to ask how many members of this Society have read the Workmen's Compensation Act? Because I believe that a large part of the misunderstandings that occur are due to the fact that the doctors, as a rule, so busily engaged in their own affairs, have not taken time to find out just what their relations to the Workmen's Compensation Act really are.

Beginning on May 23, 1917, the employee was given "the right to select a physician other than the one provided by the Association, and in case he shall be treated by a physician of his own selection, or whether in case of emergency or for other justifiable cause, a physician other than the one provided by the Association is called in to treat the injured employee, the reasonable cost of his services shall be paid by the Association, subject to the approval of the Industrial Accident Board. Such approval shall be granted only if the Board finds that the employee was so treated by such physician, or that there was such emergency or justifiable cause and, in all cases, that the services were adequate and reasonable and the charges reasonable."

In asking for a change in the law, it was alleged that the man should have a right to choose his physician, and, on the other hand, it was alleged that some of the treatment provided by the insuring companies was not adequate.

The Legislature, having given this right to the injured man to choose his own doctor, at the request of the physician rather than at the request of the injured man, it behooves the physician to give the best treatment that can be given, at a reasonable cost. The measure of their success will be found in the restoration of the injured employee to work under the new system as compared with the old, and the measure of insurance costs as assessed upon the employers of labor represented by insurance premiums.

To have the free choice of physicians continued indefinitely, it is perfectly apparent that the cost must not be excessive and the results must be good.

Now, all doctors are not well qualified to care for industrial accidents, and they should carefully consider in every case their relation to the case and their relation to their fellow practitioners, because a few cases improperly and inadequately diagnosed, that lead to long periods of disability and to the resulting loss in wages to the man and the resulting costs to the insurance funds, tend to offset the good that comes in the great majority of cases which the average man is competent to treat. Early consultations, when in doubt, in conjunction with the insurance companies, may obviate this danger.

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* Read before the Norfolk South District Medical Society, March 7, 1918.

### UNUSUAL TREATMENT.

The law does not give full medical treatment. The law reads as follows:

"During the first two weeks after the injury, if the employee is not immediately incapacitated thereby from earning full wages, then from the time of such incapacity, and in unusual cases, in the discretion of the Board, for a longer period, the Association shall furnish adequate and reasonable medical and hospital services, and medicines, when they are needed."

In asking for this law the Board made use of the following phrase:

"The Industrial Accident Board requests that the Legislature give the Board the power to require the payment of bills for medical and surgical treatment, medicine, medical and surgical supplies, crutches and apparatus when necessary, beyond the first two weeks after the injury, in unusual cases where the injury is so serious as to require and warrant such additional medical treatment."

In a general way, the Board has interpreted this section to mean: in unusually serious cases that require treatment in a hospital, in unusually serious cases where the compensation was not sufficient to care for the injured workman and for his family or his dependents if he had them, and in a third group of cases, in cases where special or unusual treatment might materially reduce the period of disability and materially minimize the consequences of the injury; in other words, where treatment would tend to restore the wage-earning capacity of a case which otherwise might have a tremendously long period of loss.

The Industrial Accident Board has been inclined to be liberal in its interpretation of the section with reference to medical treatment in "unusual" cases. The Supreme Judicial Court, as shown by their decision in Huxen's Case, 226 Mass. 292, has given a rather restricted interpretation to the word "unusual." Huxen, the employee, was injured by being burned with live steam, the burns being extensive and serious. After receiving treatment at his home during the first two weeks, the employee was given further treatment at the office of the doctor, in Boston. The employee's home was in Cambridge. The bill of the physician, at the usual rate for office calls, was approved by the Board, and the insurer appealed to the Supreme Judicial Court.

The Court said, in part: It is manifest that the Legislature did not intend to impose all expenses of medical attendance upon the insurer. The obligation to provide such attendance as an absolute duty is confined to the first two weeks after the injury. It is manifest that in the aggregate there must be many cases where medical attendance may be required for a longer period. It is not in an ordinary case requiring longer medical attendance that the discretion of the Board may be exercised to charge this attendance to the expense of the insurer. It is only in "unusual cases" that they may do so. There would be grave doubt whether a case where the employee is able to go from his home in Cambridge to an office in Boston could be so unusual as to be within the purview of the Act.

Then comes the significant part of the Court's decision: "But there is a further circumstance in the case at bar which renders it impossible to say, as matter of law, that the finding of the Board was unwarranted." The Court refers to the letter of the insurer offering to furnish "first-class treatment free of charge," or if the employee wished to continue with Dr. Morse (his own physician) "we will allow him $1 an office visit." The Court then says: "The offer to pay $1 per visit to Dr. Morse, or to provide its own physician free of charge, may have been found to be an *admission* that under the act the insurer was bound to furnish medical attendance, and hence that it was an 'unusual' case. As the finding of the Board must stand if there is any evidence on which it might reasonably have been founded, it cannot be pronounced unwarranted." And the Court modified the decision of the Board by allowing Dr. Morse a sum equivalent to $1 per office visit.

It would have been helpful to the Board had the Court stated the law more clearly as to the meaning of the word "unusual," particularly with reference to the point as to whether a case which may be regarded as "unusual" during the time the employee is confined to his home, may, thereafter, because he is able to journey to the doctor's office, become "usual" and relieve the insurer of further liability under the Act.

It seems to me that the intent of the compensation law is just as much to cure injured people as it is to determine their legal rights to compensation.

There are certain obligations which the doctor owes to the act, and by the act I mean to his patient, and the first of these obligations is to keep an adequate record, from which cause and effect may be deduced if the case comes to a hearing; and the second is to respond to calls for his presence before the Accident Board or any of its members when a case which he has treated is under discussion, because it may be that he is the only person that can give the facts in the form of adequate evidence on which the injured man may get his rights; and again, if the injured man, through the failure to present adequate medical evidence, loses his rights, the doctor also loses his rights as to the collection of his bill for the services rendered.

While the Industrial Accident Board goes a long way in protecting the rights of the injured, there is an obligation upon all parties conversant with an accident to see that the steps prescribed by law are followed, or a person, by reason of the fact that rights are derived from the law, loses his legal rights; and the first place where a man's rights need preservation is in the filing of a notice of an accident.

Notice of injury, Sections 15, 16, 17 and 18, reads as follows:

"Section 15. No proceedings for compensation for an injury under this act shall be maintained unless a notice of the injury shall have been given to the Association or subscriber as soon as practicable after the happening thereof, and unless the claim for compensation with respect to such injury shall have been made within six months after the occurrence of the same; or, in case of the death of the employee, or in the event of his physical or mental incapacity, within six months after death or the removal of such physical or mental incapacity.

Section 16 (as amended by Chapter 172, Acts of 1912, and Section 3 of Chapter 571, Acts of 1912). The said notice shall be in writing, and shall state in ordinary language the time, place and cause of the injury, and shall be signed by the person injured, or by a person in his behalf, or, in the event of his death, by his legal representative or by a person in his behalf, or by a person to whom payments may be due under this act or by a person in his behalf. Any form of written communication signed by any person who may give the notice as above provided, which contains the information that the person has been so injured, giving the time, place and cause of the injury, shall be considered a sufficient notice.

Section 17. The notice shall be served upon the Association, or an officer or agent thereof, or upon the subscriber, or upon one subscriber, if there are more subscribers than one, or upon any officer or agent of a corporation if the subscriber is a corporation, by delivering the same to the person on whom it is to be served, or leaving it at his residence or place of business, or by sending it by registered mail addressed to the person or corporation on whom it is to be served, at his last-known residence or place of business.

Section 18. A notice given under the provisions of this act shall not be held invalid or insufficient by reason of any inaccuracy in stating the time, place or cause of the injury, unless it is shown that it was the intention to mislead, and the Association was, in fact, misled thereby. Want of notice shall not be a bar to proceedings under this act if it be shown that the Association, subscriber, or agent had knowledge of the injury."

Many men leave their employment and are disabled without giving adequate notice, and it is not sufficient that the doctor assume that notice has been given in a serious case, but he should see to it that notice is given by filing such notice himself, in the name of and with the assent of the employee, with the employer, or insurer, sending a copy to the Industrial Accident Board. This will protect the injured man's rights and protect the rights of the doctor.

In addition to notice, there must be a claim filed. Section 23, Part II, of the act regarding claim for compensation, reads as follows:

"The claim for compensation shall be in writing and shall state the time, place, cause and nature of the injury; it shall be signed by the person injured or by a person in his behalf, or, in the event of his death, by his legal representative or by a person in his behalf, or by a person to whom payments may be due under the act or by a person in his behalf, and shall be filed with the Industrial Accident Board. The failure to make a claim within the period prescribed by Section 15 shall not be a bar to the maintenance of proceedings under this act if it is found that it was occasioned by mistake or other reasonable cause."

In this also, the doctor must exercise a reasonable interest.

There is another kind of claim other than the one I have called to your attention, and that is the claim for specific compensation under the Workmen's Compensation Act. It is a specific compensation for the loss or loss of use of a hand, phalange, finger, eye, leg, foot, toe, etc.; and a recent case passed upon by the Supreme Court, the Thomas Levangie case, containing a lot of things in the nature of advice, points out many things which medical men should carefully consider.

The first thing is for the doctor to tell the truth to the patient or someone representing him, that his rights may be protected.

In the Levangie case, the man fell from a staging, a distance of about fourteen feet, and received a fracture of the spine; not a typical fracture of the spine, but a typical fracture of the spine where there has been a crush of the cord. The evidence in this case shows that from the time of the injury the employee was practically bedridden and has been incapacitated for work which required the movement of the legs, but "aside from the complete paralysis of the legs (and sphincters) he is in excellent health. At the hearing before the committee, in answer to the question, 'You knew your back was broken?' the employee testified, 'I know now. I knew my back was fractured, but people time and again come to my bed and told me that people were the way I was and come through all right so I lived in that hope.' He further testified: 'I never expected to use them as before I injured them'; 'I always had hopes they would come around all right,' and thought as late as June 16, 1916, 'I would get on crutches, and finally get better so I could walk around a little bit.' To the question, 'That was your hope?' he answered, 'Yes.' "

The bearing of this is found in a later part of the decision, when the insurance company refused to pay for the specific compensation for the loss of the legs. "The failure of the employee to file a claim for compensation with the Industrial Accident Board before Oct. 30, 1916, was not due to physical or mental incapacity, or the result of ignorance of the right to additional compensation under St. 1911, C. 751, Part II, Sec. 11, and acts in amendment thereof, nor was there a mistake of fact as to the time of the injury or as to its nature, degree or probable permanency or other 'justifiable cause,' within the meaning of St. 1911, C. 751, Part II, Sec. 23, as amended by St. 1912, C. 571, Sec. 5, for the failure to make a claim within the period prescribed by Section 15. McLean's Case, 223 Mass. 342; Gorski's Case, 116 N. E. 811. Moreover, the claim filed with the Industrial Accident Board Oct. 30, 1916, was not presented to that Board within a reasonable time after Oct. 2, 1916, the day when the employee first learned definitely that his legs were rendered permanently incapable of use. Carroll's case, 225 Mass. 203."

In this case, by reason of the failure to file a claim within twenty-eight days, the man lost his rights on this and other grounds, to specific compensation for a period of fifty weeks at $10 a week.

The Workmen's Compensation Act is such a big subject, even treating it solely from a medical standpoint, that it has been possible to touch upon only a few of the more important matters of interest to physicians.

A final word, touching on the war. Everywhere we are confronted with the sign, "Don't waste it." This command refers to food. Of far greater importance is man power. Don't waste it. Save it. Try and save at least one working day for every man treated by you; more than one day, if possible. Such saving means an extra day for the man, one more day's production for his employment, and, above all, an added day for our country.

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EAST BOSTON MEDICAL SOCIETY.—Dr. L. G. Lowrey, chief medical officer of the Psychopathic Hospital, will speak before the East Boston Medical Society on Friday evening, May 24, at 8.15 P.M. Subject: "The Clinical Manifestations of Mental Disease." Those interested in the subject are invited to visit Walcott's Hall, Central Square, East Boston, on that night.

J. DANFORTH TAYLOR, *Secretary*.

## Original Articles.

# THE APPLICATION OF ANAPHYLACTIC SKIN TESTS TO GENERAL MEDICINE.*

By Samuel Ayres, Jr., Boston,

*Harvard Medical School.*

The purpose of this discussion is to call attention to the broader possibilities of diagnosis and treatment on the basis of information obtained by the so-called anaphylactic skin reactions. Nearly everyone is familiar with the brilliant progress recently made possible by this method in the control of hay-fever and asthma. Few people, however, have gone beyond this; in fact, when one speaks of the anaphylactic skin tests, these two conditions are usually thought of. Some investigators have endeavored to apply the reactions to other disorders of an anaphylactic nature, and are invading the fields of general medicine. The work is entirely new, the literature scant, and adequate data for measuring the success of the venture are as yet unavailable. The aim in presenting this subject, therefore, is not so much to offer statistics as to arouse interest in the possibilities at hand, which may lead, perhaps, to further investigation and the tabulation of more data. Progress in this field will not be made in the laboratory, but in every-day clinical practice and in proportion as the practitioner becomes interested. The technic is extremely simple, requiring neither elaborate apparatus nor profound skill.

But, first, let us understand what we mean by anaphylaxis, for that is the underlying principle of the disorder, the diagnosis and the treatment of which we are to consider. I do not intend to bore you with a long discussion of this matter, which is, doubtless, more or less familiar. I mean to sketch only a brief outline, which I have summarized from a lecture by Dr. Robert A. Cooke of New York in the *Medical Clinics of North America* for November, 1917.[1] I can do this best in the form of a table. Our animal is a guinea pig, and the foreign protein which we shall inject is horse serum. Each Roman numeral represents a different guinea pig.

| Animal | First Procedure | Second Procedure | Result | Antibodies | Condition |
|---|---|---|---|---|---|
| I. | Serum injected | | No symptoms | Absent | Non-sensitive |
| II. | Serum injected | Next day, serum injected | No symptoms | Very few attached to cells | Non-sensitive |
| III. | Serum injected | After 10 to 14 days serum injected | Anaphylactic shock and death | Many and attached to cells | Sensitive |
| IV. | Serum injected | After 10 days a sub-lethal injection. Symptoms but not death. On 11th day large dose | No symptoms | Excess free | Desensitized |
| V. | Serum injected | Injections on 10 consecutive days. No symptoms. On 11th day a large dose. | No symptoms | Excess free | Immune |

The theory which most plausibly accounts for the above results is as follows: A foreign protein (in this case, horse serum) is not in itself toxic. When such a foreign protein gains entrance to the circulation of an animal for the first time, it stimulates the production of specific antibodies which previously did not exist. These antibodies, which may or may not be enzymes, are produced by certain cells of the body and seem to be intimately associated with the cells which produced them. If time enough is allowed for a sufficient number of antibodies to accumulate, and a second dose of the same protein is introduced, the antibodies react with the protein, splitting it into toxic fragments, which in turn injure the body cells and give rise to anaphylactic symptoms. If, on the other hand, an excess of antibodies has been produced and are free in the blood stream they combine with the foreign protein and prevent it from reacting with the body cells, just as antitoxin neutralizes toxin. In other words, when antibodies are absent or few in number, we have the non-sensitive state; when numerous and attached to body cells, we have the sensitive or anaphylactic state; and when in excess with many unattached to body cells, we have the immune state. Anaphylaxis and immunity are the same in principle, differing only quantitatively.

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* Read before the Boylston Medical Society, March 22, 1918.

As noted in animal No. V on the chart, small injections on consecutive days do not give rise to symptoms, but carefully controlled experiments[2] have shown that such a procedure, continued over a long period of time, leads to very definite pathological changes in the arterial walls of most of the organs. This work will be referred to later in speaking of arteriosclerosis.

Of course, clinically, the typical picture of anaphylactic shock with respiratory failure and death is, fortunately, a rare occurrence, and happens only when an animal serum, usually containing an antitoxin, is injected into a person who is sensitive to that particular animal. But all degrees of the milder grades of anaphylaxis are met with in everyday practice, and are often unrecognized.

As stated above, the antibodies produced by the sensitizing protein or antigen tend to attach themselves to, or develop in the cells of different tissues. Clinical manifestations vary according to the tissue or group of tissues sensitized. If the smooth muscle cells of the bronchi and the mucous membrane of the respiratory tract are sensitized, we have asthma from a narrowing of the bronchioles, due to contraction of the smooth muscle and edema of the mucosa. If the mucous membranes of the eyes, nose and throat are sensitized, anaphylaxis is manifested as hay-fever; if it is the epithelium of the skin, we have urticaria or eczema; if it is the connective tissue, we have angioneurotic edema; if the intestinal mucosa and smooth muscle, we have gastro-enteritis from edema and spasm. The involvement of joint surfaces results in arthralgia; that of renal elements in pseudo-nephritis.[3]

We do not have to indulge in guesswork to attribute these symptoms to anaphylaxis; we have only to observe a patient with diphtheria who has received injections of antitoxin, the offending protein, of course, being the horse serum. After a few days of incubation the symptoms begin (presumably when the antibodies have reached a sufficient concentration). The reaction is manifested by a transient rise in temperature, pulse and respiration, by cutaneous outbreaks such as urticaria and erythema multiforme, pains in the joints, gastro-intestinal disorders, respiratory symptoms, a transient acute nephritis, etc. The picture is a familiar one.

Then, again, we have the everyday symptom-complex of the person who has been poisoned by a definitely recognized article of food, such as strawberries, lobster, shrimp, or salmon. The manifestations are in no wise different from those of the diphtheria patient who has received horse serum. In the first instance, we expect a reaction, and we do nothing about it except to make the patient comfortable; in the second case we recognize a definite etiology to account for the symptoms, and we advise the patient to omit that article from his diet.

But what of the patient who seeks treatment for urticaria or asthma, or acute indigestion, or non-rheumatic arthralgia, or chronic and persistent constipation,—any of these symptoms alone or in combination,—who can incriminate no definite part of his diet? These symptoms, again, are like those produced by horse serum or strawberry poisoning, even though the etiological factor is obscure. Of course they may have been produced in an entirely different way,—no one would deny that,—but there is at least an even chance that they are purely an anaphylactic manifestation. Surely we should be able to recognize old friends; and, in fact, we have progressed so far that we single out the respiratory symptoms, such as hay-fever and asthma, and treat them accordingly. By means of the cutaneous anaphylactic reactions, we test out various proteins, including horse hair, horse dandruff, pollens, bacteria, and food proteins, etc., and we note those to which the patient reacts. The food proteins we eliminate from the diet; we get rid of offending bacterial proteins by attempting to clean up foci of infection, such as bad teeth or tonsils, and we desensitize the patient against pollens and horse-hair proteins by the principle of small injections, as shown in chart under IV.

This is a thoroughly scientific method of procedure, but why use it only in respiratory anaphylactic symptoms, to the exclusion of all others? Why not employ it in cutaneous or gastro-intestinal disorders if we can rule out other causes for the disturbance? It is to be remembered that anaphylaxis shows itself according to the tissues which are sensitized.

Dr. Henry A. Christian of the Peter Bent Brigham Hospital has recently published a series of ten cases[3] which he groups together under a definite clinical entity, the pathology of which consists in transitory focal lesions of the small blood vessels and capillaries, causing dilatation, diapedesis, or exudation, either singly or in combination. The areas of vascular involvement may be either in the cutaneous, mucous, or serous surfaces, subcutaneous tissues, muscles, or viscera, hence the variety and complexity of symptoms. The skin lesions may manifest themselves as purpura, erythema, urticaria, angioneurotic edema, and the visceral lesions as arthritis, gastro-intestinal symptoms, hematuria and various disturbances of renal function. Since the visceral lesions may occur without concomitant skin lesions, the difficulties in diagnosis are apparent. Dr. Christian does not offer any explanation to account for this clinical picture, but he points out the similarity between the joint symptoms and the arthralgia of serum sickness. The almost obvious anaphylactic nature of this condition is well illustrated in Case No. 9.

The patient, a man, aged 58, had had a large number of attacks of localized swelling in the right hand, and other manifestations of urticaria. The day before coming to the hospital, he was in his usual health until the afternoon. While having tea his abdomen became distended, there was some belching of gas, he felt rather uncomfortable and went to bed. He slept poorly that night, due to pain in epigastrium and the discomfort from distention. The next morning when he came to the hospital, his abdomen was found still to be distended and diffusely painful and slightly tender, suggesting distinctly intestinal obstruction. For twenty-four hours very little result was obtained from enemas or rectal tube. Then a good fecal result was obtained and the patient passed a considerable amount of gas. Forty-eight hours after admission, his abdomen was much less distended and the patient was more comfortable. Four days after admission, scattered patches of erythema and edema appeared over his hands, arms and feet which, he said, were similar to those that he had repeatedly had after eating fish, shellfish or canned goods that were, possibly, not quite good. He recalled having eaten sardines on the day that his abdomen became distended and the discomfort developed. These findings suggested that possibly the intestinal obstruction was due to a similar type of lesion (*i.e.*, an edema) in the intestinal wall. A bismuth roentgen ray study of the gastro-intestinal tract, made the following day, confirmed this hypothesis. Five hours after taking the bismuth meal, a sausage-shaped dilation with a narrow outlet was seen in one of the upper loops of the ileum. Three days later, all symptoms had disappeared, and two subsequent roentgen ray examinations revealed no evidence of the obstruction.

Dr. I. C. Walker employed the anaphylactic skin tests, using a large number of proteins, including sardines, but without getting any positive reactions.

Another case might be cited from Cooke's lecture already mentioned.[1]

A man, aged 36, asthmatic since the age of 4, came to the hospital, complaining, in addition to his bronchial symptoms, of chronic constipation and gastric indigestion with flatulence, pyrosis and eructations. By means of the cutaneous protein reactions, he was found sensitive to horse hair, ragweed, and a long list of food proteins. With the elimination of these particular foods from his dietary, all enteric symptoms ceased. He was treated for his bronchial symptoms by subcutaneous desensitizing doses of horse and pollen proteins.

Cooke points out that the presence of a positive cutaneous reaction does not necessarily mean that that particular protein when ingested will always cause symptoms, but that the results of treatment based on this line of study yield more satisfactory results than were previously obtained. He finds that treatment to relieve food anaphylaxis is unsatisfactory as compared with desensitization against pollens, and advises avoidance of food proteins which are known to offend.

The pathology responsible for these symptoms, as already indicated, is a multiple local edema, involving the small blood vessels and capillaries, and occurring in any or all tissues. The exact mechanism by which this edema is brought about may seem to be a question of unimportance; as a matter of fact, it is of considerable importance if we are to treat the condition intelligently with drugs. For a long time urticaria has been treated by calcium lactate, on the theory that a deficiency of calcium in the blood is responsible for the condition by delaying the coagulation time. G. R. Minot,[4] in studying three cases of severe urticaria, found the coagulation time normal in two of them, and delayed in one; and Pepper and Krumbhaar[5] deny that there is any deficiency in calcium. Possibly the anaphylactic agents, such as foreign serum or shellfish (Heidenhain's lymphagogues of the first class), produce localized edema by injuring the capillary walls, causing an increased permeability, as shown by the protein-rich nature of the exudates.[6] Or, according to Martin Fischer,[7] the edema may be due to a localized increase of acid products, caused by the anaphylactic process, resulting in the tissue colloids imbibing water. Fischer produced an experimental urticaria on a gelatin plate by injecting formic acid into the gelatine with a hypodermic syringe and then immersing the plate in water. A typical urticaria wheal resulted wherever the acid had been injected. This phenomenon has a close analogy in the wheal from a mosquito bite or a jellyfish sting.

At all events, the exact mechanism of the process is still a matter of discussion. Without denying that calcium lactate may have a place in therapeutics, it should be borne in mind that it is by no means the panacea which some people regard it. The best treatment in localized edemas such as we have been discussing is, first, to rule out non-anaphylactic causes, and then by means of the cutaneous tests to isolate the offending protein, and manage the case accordingly.

Perhaps the testimony of a few men who have employed these reactions will carry weight.

F. B. Talbot, of Boston,[8] in discussing the "Rôle of Food Idiosyncrasies in Practice," says that eczema has been shown in many instances, and arthralgia in some cases, to be due to food sensitization. In regard to the inheritance of such sensitizations, he finds that in twenty-nine of thirty-six cases studied, there was a definite family history of asthma, hay-fever, or eczema.

H. F. Shattuck, of New York,[4] says that the almost constant appearance of general urticaria in such definite anaphylactic conditions as serum sickness, together with the beneficial results obtained in some cases of urticaria from protein restriction in accordance with positive anaphylactic skin reactions, points strongly to a protein sensitization as the etiology of most urticarias.

Charles J. White, of Boston,[9] using the cutaneous or intracutaneous tests, found about 80% of eczematous patients sensitive to some of the common food types. He is not as optimistic, however, as some investigators, in the therapeutic results obtained by eliminating foods as indicated by the tests; he has had more success in this way with children than with adults. It is necessary, of course, as White has done, to rule out other possible causes of eczema, such as fat indigestion, by examination of the stools.

Blackfan, of New York,[9] found that of twenty-seven patients with eczema, twenty-two gave evidences of susceptibility to proteins, and that the removal of some or all of the animal proteins from the food brings about great improvement in some cases of eczema in older children and adults.

N. S. Ferry, of Detroit, Michigan,[9] concludes that the anaphylactic phenomenon is one of the most valuable diagnostic agents we have at present.

Cooke, of New York,[1] found that the cutaneous tests have given satisfactory results in 50% of urticarias, 25% of angioneurotic edemas, but did not give results in eczema or hypertrophic arthritis. He brings out the important point that over 50% of sensitized people show sensitization to more than one protein.

J. A. Turnbull, of the Massachusetts General Hospital, Boston,[10] is an enthusiastic advocate of the anaphylactic tests, and has had wide experience in the work. He has found positive reactions and has met with therapeutic success by removing the specific proteins in many cases of gastro-enteritis, headache, chronic constipation, arthritis deformans, hay-fever, asthma, psoriasis, eczema, urticaria, angioneurotic edema, erythema multiforme, and one case of lupus erythematosus. He has also used the tests on normal individuals with no symptoms, as controls, and has found uniformly negative reactions.

The technic of the cutaneous tests is extremely simple. The powdered protein extracts may be obtained in ampoules from several pharmaceutical houses. The following is the procedure used by Dr. Turnbull.

1. Wash the flexor surface of the forearm from the bend of the elbow to the wrist and rinse with 70% alcohol.
2. Dry with sterile gauze.
3. Using a two-tenths per cent. solution of KOH as a diluent, place one drop just below the bend in the elbow. Distal to this, place three drops across the forearm, each drop

equally spaced. Cover the remainder of the forearm with similar three-drop rows, stopping just before reaching the tendinous part of the wrist.

4. With a sharp scalpel make an incision about five-tenths of a centimeter long, through the drop into the skin, but not deep enough to draw blood.

5. Immediately place a small bit of the powdered protein on the end of the knife blade, and mix it thoroughly with the drop of KOH. Perform a similar operation with the remaining drops, using a different protein with each one.

6. The first drop just below the bend of the elbow is used as a control, the incision being made, but no protein added. The location of the control drop may be varied, but Dr. Turnbull has found this region to be particularly sensitive, so that if there is any tendency to a false positive reaction, it can be easily detected with the control in the most sensitive area.

Usually there is a slight transient nonspecific wheal formation, due to trauma, but this can be ruled out because it occurs in the control as well. It lasts a variable time and may disappear.

The true reaction occurs from two to twenty minutes or longer after the protein has been applied. Usually the reading is taken fifteen minutes after the last incision has been made. Dr. Turnbull regards a reaction as positive when there is a wheal, an erythema, or a combination of the two with a total narrow diameter of three millimeters, or more, appearing at the site of some of the incisions, but absent in the control incision. A reaction less than this should be regarded as negative or questionable. Some reactions may be very intense and involve a large area.

Practically all of the proteins with which an individual is likely to come into contact are obtainable on the market in a purified state. Thus we have the food proteins, such as beef, pork, chicken, lobster, strawberry, banana, wheat, rye, etc.; different bacterial proteins, pollen proteins, and inhaled animal proteins, such as horse, dog, or cat dandruff or hair, etc. It is not necessary to try out the whole list on every individual; the indications in each case should determine the procedure.

You probably already have in mind the practical bearing of all this. Suppose a patient comes to your office complaining of chronic urticaria and constipation, and with no definite ideas as to etiology. Is your treatment going to be rational or irrational; is it going to be scientific or of the old-fashioned hit-or-miss variety?

Are you going to give him salol or beta-naphthol as an intestinal antiseptic, calcium lactate for a hypothetical deficiency of calcium in his blood, and tell him to stop eating all meats? Or are you going to determine in a very simple manner by skin reactions to what proteins he is sensitive and regulate his diet according to definite indications, beginning, of course, with a thorough catharsis?

According to the first line of treatment there are three objections. In the first place, the efficacy of intestinal antiseptics is a matter of considerable debate, but, granting their value, they can never result in permanent cure so long as anaphylactic proteins are being ingested or inhaled. In the second place, the evidence in favor of a calcium deficiency in urticaria is balanced or even outweighed by evidence to the contrary. However, some very capable men claim satisfactory results from the use of calcium, and it is possible that some urticarias and angioneurotic edemas may be due to a disturbance of calcium in the blood, brought on or aggravated by such decalcifying agents as fruit acids. This is open to question.

In the third place, and most important of all, the prescription of a diet should be as carefully considered, and as intelligently ordered as the prescription for any drug. What good is it going to do our patient when we tell him to cut out all meats and fish and raw fruits, if his symptoms are due to the wheat or rye in his bread, or the casein in his milk? Cooke[1] emphasizes the fact that over 50% of sensitized people show multiple sensitization. Our patient may be sensitive to beef, eggs, shrimp, wheat, casein, and beans. How is it going to benefit him, then, if we order him to eliminate from his dietary all meats, or all fruits, or all vegetables? Diet is an individual problem, and we should endeavor to make the food fit the patient, instead of trying to make the patient fit the food. A tailor who would attempt to fatten up his customer so that he would round out a certain desirable suit of clothes, instead of altering the suit to fit the customer, would be sent to the Psychopathic Hospital.

In other words, the aim in treating any disease should be to remove the underlying cause; with this in mind, drugs are useful as adjuvants. The cutaneous anaphylactic reactions offer a means for determining the underlying cause of disease in a large number of conditions.

In conclusion, let us look forward a bit and see if any other diseases are likely to fall within the scope of analysis by this method.

Louis F. Bishop, of New York,[11] regarding arteriosclerosis as being due to a disturbed physiology of the cells of the body of wide general distribution, resulting in degenerative changes in the blood vessels and all the organs, emphasizes his belief that there is a disturbed relationship between the cells and the nutritive material with which they have to deal, or the bacterial proteins with which they come into accidental contact. Undoubted and well-recognized benefit is seen in such patients when there is diminution of the intake of animal food, but he has secured equal, if not greater improvement in the condition of the patients, not by a low protein diet, but by what he calls a "few protein" diet. "The question is not whether food is good food, or has a certain food value, or what its qualities are, so much as whether it is the right food for the one who has to live on it." He believes that the proper study of dietetics in disease depends upon a study, not so much of the food as upon the reaction of the patient to the food. And this, in a few words, epitomizes the theme of our discussion.

In an article written two years ago, Bishop referred to the new work of food sensitization tests, but said that he had not employed them because the methods at that time had not been standardized. Purified proteins have only recently been obtainable on the market.

His usual method of treating arteriosclerosis is to remove all classes of usually offending proteins, such as are contained in eggs, fish, meat, etc., and after definite improvement has set in, to return these proteins one at a time, noting the effects, and permanently eliminating those which cause bad reactions, as measured by pain, blood pressure, indigestion, renal function, etc.

To quote a paragraph[12]:

"A man with arteriosclerosis, feeling pain in his chest every time that he moves, suffering from a blood pressure that is so high as to be a danger to his life, with kidneys that are unable to perform their functions, can by proper diet, exercise, and attention to the state of his intestinal canal, be so improved that he will present all the appearances of health, perform all labor that can be reasonably required of a man of his age, and can live out the period of his expectation of life as laid down by the insurance tables. That is all one could ask."

While it is perfectly possible and not at all unlikely that arteriosclerosis may result from conditions other than anaphylaxis, at the same time there is experimental evidence to support his views. I would call attention to the work of T. H. Boughton, published recently in the *Journal of Immunology*.[2]

He found that repeated injections of foreign protein, such as egg white and horse serum, into sensitized guinea pigs, produced lesions of the smaller arteries of the liver and spleen in 100% of cases, and of the kidneys and heart in 66% of cases. These lesions were characterized by degeneration and regeneration of endothelium, edema and fissuring of intima and media and sometimes splitting of the internal elastic lamina. The lesions were interpreted as being subacute rather than chronic. Five animals were injected with from twelve to seventeen doses of egg white or beef serum during a period of six to eighteen weeks, the doses being so spaced as to avoid anaphylactic shock at any time. This experiment simulates the condition in the human arteriosclerotic who receives by mouth frequent small doses of a protein to which he has, for some reason or other, become sensitized. When the animals were finally killed and the tissues examined histologically, vascular lesions were found similar to those in the other experiments, but less severe than in those animals which were allowed to die in anaphylactic shock.

Certainly the disease of arterioscelorisis is a field which bears investigation by means of the cutaneous protein tests.

In view of the steadily rising death rate in cancer under surgical treatment, L. D. Bulkley,[13] senior physician to the New York Skin and Cancer Hospital, in his monograph on cancer, just published, speaks as follows:

"Personally, I believe that sooner or later it will be generally recognized that the starting point of cancer occurs in some cell or cells, previously normal, probably as the result of local irritation, in which there is a deposit of some of the elements of faulty nitrogenous partition, induced by undue ingestion of animal protein; and that the malignant, reproductive process in the cells is kept up by a continuance of the same supply of imperfectly disintegrated nitrogenous matter.

"The x-ray and radium, as also caustics, are in the same position as surgery, and can do little more than cause to disappear, more or less temporarily, some of the lesions which have developed from causes which they cannot reach."

The New York Skin and Cancer Hospital maintains a medical clinic for cancer. Dr. Bulkley bases his arguments on many years of observation with successful medical and dietary treatment alone or combined with surgery or radiotherapy.

It is, no doubt, clear, from what has been said, that the employment of the cutaneous anaphylactic reactions has a legitimate and important place in the field of general medicine. Many cases will fail to give satisfactory results, both from a diagnostic and therapeutic standpoint, but that should not obscure the good results obtainable in other cases. Very few diagnostic agents are 100% perfect. The electro-cardiogram often shows nothing abnormal in a heart which may fail the next day. The Wassermann reaction frequently falsifies. Renal function tests are often untrustworthy. X-ray plates are sometimes of extremely negative value, especially in regard to showing gallstones or abdominal adhesions. And even the stethoscope may fail to detect a centrally situated tubercular process in the lung. Yet we would not give up any one of these adjuncts to diagnosis. Let us not be too harsh, then, in criticizing the cutaneous anaphylactic tests, but rather endeavor to improve the method and extend its applicability.

It is not within the scope of this paper to discuss the therapeutic measures intended to cure anaphylaxis by the administration of desensitizing doses of the specific protein. I wish only to emphasize the importance of the cutaneous anaphylactic tests as a diagnostic agent.

I think the most important statement in this discussion is that of Bishop's, in which he insists on the fact,—

"The proper study of dietetics in disease depends upon a study, not so much of the food, as upon the reaction of the patient to the food."

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# DIFFERENTIAL DIAGNOSIS IN PSYCHIATRY: A COMPARISON OF SYMPTOMS IN VARIOUS DISEASE STATES.[*]

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THE importance of accurate observation and intelligent interpretation of symptoms is, perhaps, nowhere in medicine so clearly seen as in psychiatry; and in psychiatry nowhere any more plainly than at the Psychopathic Hospital. There are two reasons for this latter fact: (1) the short period of observation; (2) the large number of border-line and "not insane" cases which are seen.

Receiving only temporary care, voluntary or special legal cases, which for the most part remain not more than ten days in the hospital, it follows that rapid, intensive work is necessary, with accurate observation and intelligent interpretation the *sine qua non* of success in the work.

Hence, it is necessary that the symptom analysis be thorough, and *symptoms* and *states* be correctly related to disease process, if our diagnoses and prognoses are to stand the test of critical inspection by relatives, courts or state hospitals to which the patient may be sent. It is clear that mistakes cannot entirely be avoided, but all mistakes should be studied with diligence and avoided thereafter. It is usual to find that understudy or improper interpretation are at the bottom of the more serious errors.

Careful study and analysis are particularly necessary in order to avoid the most common error in psychiatric diagnosis,—that of classifying any dementia or poorly understood case as one of dementia precox. This is little more than a scientific crime, and tends to retard the progress of psychiatry. It is far less dangerous to plead ignorance and leave the case undiagnosed than to be pseudo-scientific and pronounce the case one of dementia precox. If this disease is to stand as a psychiatric entity, it must have a recognizable symptomatology. Nor is *outcome in dementia* sufficient to establish such a diagnosis. The dementia must be of a particular sort, since precox is *not* the only disorder whose sequence is dementia.

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[*] A contribution of the Massachusetts Commission on Mental Diseases, series of 1918.

Similarly, we may take any other symptom or state,—dementia may be regarded as either,—and we find that it may occur in a variety of diseases, each of which, as a rule, has certain characteristic signs.

We have found that a most useful division of mental activities is that into the sensorium-intellect and emotions-will. It comes out quite clearly on analysis of any large group of cases that the types of disease process associated with disorders chiefly in one of these two fields (obtained by reduction from the original four) are very characteristic.

Thus, those mental *states* in which the symptoms are primarily and predominantly in the sensorium-intellect field are very clearly related with the toxic-organic-epileptic disease processes. Also, the disturbances primarily and predominantly in the emotion-will field are clearly related to the schizophrenic-cyclothmic-psychoneurotic-psychopathic group of disease processes, *i.e.,* with disorders of the types usually thought of as functional.

Hence, it is necessary to differentiate with great care between primary and secondary effects in any mental state; and to determine degree of disturbance in all fields. A depressed patient may develop *paranoid* ideas (often as a rationalization of the state), while, conversely, a paranoid patient may develop a *depressed* state, as the emotional reaction to the ideas. In each case, the complex mental state may, on superficial analysis, appear to be the same; yet how different is the total effect after careful examination and evaluation, and how different the end state!

Primary symptoms are those which are common to all cases of a particular group: for instance, the emotional changes of dementia precox or the intellectual losses in paresis. These are obviously the most important and characteristic symptoms. The secondary symptoms are those which occur in some, but not all, cases of any group—such as the hallucinations in dementia precox, or the delusions of grandeur in paresis. Such are diagnostically of great importance when present.

Then we have certain rare symptoms,—the symptoms may in themselves be common, but rare in particular combinations. Thus *real* memory defect is not an essential constituent of the dementia precox picture, though it does occur. In these cases, the memory defect is always more apparent than real, and never dominates the disease picture.

The *primary* symptoms are *not* always predominant; frequently they are detected only with difficulty because of the greater rôle assumed by secondary and rare symptoms. It is in such cases that experience and skill in examining and interpreting symptoms are of such great importance in determining diagnosis and prognosis.

We must realize that in most cases of mental disease the *entire* mind is affected, but the affection is usually differentially greater in certain fields according to the etiology. The disturbance may be only very slight in certain fields of activity, while very marked in others. Always we can recognize the primary and secondary elements in the mental state, and from a clear analysis of these we can easily proceed to the more important etiological diagnosis. At present psychiatric entities represent a queer mixture of state, etiological and prognostic ideas. Thus manic-depressive is a diagnosis of *state,* as is organic dementia. General paresis and arteriosclerotic psychosis are typical examples of etiologic diagnosis; and dementia precox often represents a prognostic diagnosis (especially in the paranoid forms). This merely reflects, of course, that the heterogeneous condition of clinical and pathological work in psychiatry is, perhaps, only a reflection of the infinite difficulties of the study of mind.

With these various points in mind—the analysis and interpretation of symptoms; the conception of *states,* with primary and secondary phenomena; the necessity for careful and complete analysis of the *whole* individual; the relationship of states to causal processes; and the scientific importance of symptomatic (as opposed to termination) diagnoses—it has seemed worth while to present a brief analysis of mental symptoms and states which shall be of value in clearing and unifying diagnostic lines, even though we recognize the constant changing of concepts and know that eventually the lines must be recast.

This paper does not present anything especially new, but largely represents a re-working of standard psychiatric material from the viewpoint of rapid and thorough differential diagnosis. What we are especially interested in is in rapidly narrowing down the diagnostic field to a few possibilities, and then finding the characteristics which permit *accurate* diagnosis.

On the side of sensorium-intellect we have to do with disorders of perception (illusion, hallucination); of attention (hyperprosexia, aprosexia); of consciousness (clouding and disorientation in their various degrees); of memory (retentive, recollective and associative as types; amnesia, hypermnesia, paramnesia, as symptoms); of judgment (delusions, fixed ideas, obsessions); and the judgment and memory largely determine the associations (though not the associative mechanism).

Combined disorders of the certain of these—namely, disturbances of attention, consciousness and *especially* of memory—are particularly characteristic of the various disorders in which we find actual discernible causes for damage to nerve cells,—alcoholism and other exogenous poisons, fever, organic disease of the nervous system (meningitis, syphilis, arteriosclerosis, senile atrophy, trauma, tumor), endogenous toxemias (*i.e.*, so-called somatic or symptomatic psychoses), and epilepsy. In addition, in many of these cases we find very characteristic hallucinations and delusions.

We may contrast the very active processes (usually of toxic origin), such as delirium tremens, with the less active (usually organic), such as senile dementia. In the former case the entire mental life is taken up with the fleeting mass of terrifying hallucinations and delusions, and consciousness is markedly clouded; in the latter there is progressive and gradual loss of the stored knowledge, plus attention and consciousness disorder, so that the patient loses the higher faculties of self-control, *i.e.*, inhibition lost through ignorance.

It takes no particular argument to show that in the groups of psychoses mentioned the major symptomatology lies in the sensorium-intellect. A first group—paresis, senile dementia, arteriosclerotic, the chronic alcoholic psychoses (except alcoholic paranoia), some of the somatic cases, epilepsy, *i.e.*, in general the chronic "dementing" group—have as primary symptoms of the mental trouble disturbances in the retentive field (of memory), combined with certain disturbances of attention and assimilation and often of consciousness. Other symptoms may be very variable and running through the entire range of mind, but these are the symptoms common to all cases of a particular group. The differential diagnosis between groups is, then, to be based on special signs and symptoms of each.

Thus we differentiate paresis largely on the neurological changes: pupils, reflexes, speech, handwriting. The state of activity is not, as a rule, of much differential value, though rarely it may be. Such symptoms as delusions of grandeur, euphoria, etc., are very characteristic when present, as they are in a certain percentage of cases.

Senile dementia is differentiated on the basis of age at onset, the characteristic loss of *recent* memory, with the retention of remote memory, disorientation,—the patient living in the past,—with restlessness at night, forgetfulness for immediate happenings, and conduct disorder.

Alcoholic deterioration is characterized by the long history of alcohol, the loss of details in memory, the humoristic emotional tone, lack of finer sensibilities, and the absence of signs of organic disease. One particular chronic alcoholic psychosis, Korsakow's syndrome, is especially characterized by polyneuritis, memory disturbance and fabrications. When the active process subsides, we very frequently find a pronounced alcoholic dementia.

Arteriosclerotic brain disease is to be differentiated on the basis of recurring periods of confusion, with amnesia therefore and neurological changes characteristic of the disorder. The age of onset is also of importance, as is emotional instability.

Epileptic "dementia" is to be differentiated by the history of fits, the striking slowness of reactions (without depression), and the pathological irritability. The diagnosis may be correctly made even in the absence of a good history of frank fits, by the minor signs. Of course the important thing in epilepsy is the etiology, for which intensive search should always be made. The epileptic psychoses are, as a rule, more nearly allied to the next large group, with which they will be considered.

In the second large group, *i.e.*, the acute alcoholic (with the important exception of acute alcoholic hallucinosis), other acute toxic psychoses of exogenous origin, severe meningitis, acute traumatic, acute somatic (including puerperal, cardio-renal, etc.), fever psychoses, and epilepsy at or after a convulsion ("psychic equivalents")—in general, then, the acute "fulminating" group—we have to do with very active symptoms in the field of consciousness and perception (confusion, disorientation, failure of attention, hallucinations and illusions, especially visual); and usually the patients are so difficult of examination that memory cannot carefully be tested, but it is sure to be much confused (though not entirely lost) if tested. The consciousness disturbance varies from only a slight cloud to stupor,—perhaps muttering delirium,—and perceptual disorders are usually present to a marked degree. With recovery of consciousness we find characteristic circumscribed amnesias, but without much loss in the memory of events previous to the attack. In these cases we have very marked disorders: delirium, semi-delirium, stupor; and the very first thing we need to know is the cause.

So with any *confused*, hallucinated, and terrified or active patient, or with a stuporous patient, we need to examine at once for alcohol, for the acute infectious diseases, including pneumonia, typhoid, cerebrospinal meningitis, blood infections; for retained uterine contents in the post-partum cases; for chronic disease such as cardio-renal and diabetes; for organic disease of the central nervous system; for epilepsy.

Hence, we need to know the immediate history and physical state of the patient; temperature, pulse and respiration; lumbar puncture; blood findings (cytology; culture; nitrogen content); urinalysis. Thus we have erected at once a practical program for speedily determining cause and starting effective treatment. A careful physical examination, including urinalysis and the temperature, is the most important of these, aside from a history of immediate etiology. Based upon these, we can proceed to other tests, such as lumbar puncture and blood examination, which may be needed to clear up the etiology. In fact, this may be said to be the ideal method of procedure in any case of any group,—the quick but accurate evaluation of the mental symptoms making up the state, the immediate history, the physical examination determining the presence or absence of physical disease.

We must remember that not all physical diseases are capable of causing mental disease, and that mental disease of any type may co-exist with almost any type of physical disease. It follows that for the establishment of etiological factors the mental disturbance must be of the type which the somatic disease ordinarily causes. Only after the most searching and rigid analysis should markedly atypical cases be included.

In the confused, hallucinated, amnestic patients, we are most likely to find acute causes of one sort or other, which are amenable to the more ordinary types of treatment. It is in this group that the internist, surgeon and gynecologist are of the greatest service.

The differential diagnosis in this group depends obviously on the establishment of a toxic cause by history or, more particularly, by the physical examination. It must be remembered that in some groups the delirium is but the forerunner of a prolonged attack. Such is true in those Korsakow's cases where the onset is with a delirium-tremens-like attack. Similarly, it is extremely difficult in the puerperal cases to make out whether we are dealing with a purely toxic affair, or whether the puerperium and toxemia are merely exciting events for a manic-depressive or dementia precox psychosis. There are a number of other rather obscure points in this group.

From the standpoint of differential diagnosis, the important point is to realize that confusion and amnesia characterize the organic group, while confusion, circumscribed amnesia and hallucinations characterize the toxic group, with epilepsy sometimes in one group and sometimes in the other.

Primary disorders in the field of the emotions and will are most clearly made out in dementia precox, manic-depressive, psycho-neurotic and psychopathic states. The emotions are subject to various morbid alterations,—exaltation, depression, instability, dulling or deterioration. The will shows itself in disorders of activity; of influencibility, ranging from pure negativism to extreme suggestibility; in impulsivity. The disorders in these two fields tend to occur together in certain fairly definite combinations.

The complicating factors in diagnosis lie in the fact that emotion-volition disorder occurs in psychoses belonging to any group, and the conduct may be quite similar in groups of widely varying etiology. The essential points of differentiation lie in the state of consciousness and in the memory, together with an analysis of the fitness of conduct to ideational background.

The simplest psychotic state known is that of the manic-depressive, either manic or depressed. Here we have to do, in the milder types, with an exaggeration of normal emotion and will. Intellectual processes, though accelerated or slowed, are not as a rule greatly damaged, and there is no disturbance of memory or consciousness. They tend to recovery without dementia. Disturbances of consciousnesss, with resulting circumscribed amnesia, do rarely occur; but only in the very severe attacks and never predominating the picture.*

In these states hallucinations are very rare. Delusions are fairly common, but their content always agrees with the emotional state, and they are usually personal,—either somatic or autopsychic.

More complex are the schizophrenic states, where again the emotion and will disturbance is the predominant feature. Here the disturbance is in a new direction—the emotions and will impulses do not correspond. The indifference to all about them is striking, as is the indifference manifested to ideas which are in themselves of a torturing nature. With a clear consciousness they are hallucinated; giving the *impression* of clouding and of memory loss, they are, nevertheless, oriented and without particular memory defect. Even the negativism, muteness and stupor are often recovered from with surprisingly little amnesia for the period when the patient seemed entirely withdrawn. The difficulty in these cases is in accessibility and in expression (both dependent on volition); not in the state of consciousness or in loss of intellect. Hallucinations and delusions of all sorts occur, but the reaction is usually not in accord with the beliefs held by the patient. States of excitement and of depression occur and tend to alternate rapidly; the production is often senseless, revealing the crossing of will impulses; the activity is queer and not easily understood; there will be evasiveness, inability to think connectedly, mannerisms and many other symptoms referable to will difficulty. The essential point we must recognize is that clouding of consciousness and intellectual disorder are *not* the characteristic symptoms of the precox process—and that we must hesitate to make such a diagnosis in cases where symptoms are not predominantly in the emotions and will.†

Accordingly, we find that in the emotion-volition group the manic-depressive is characterized by quantitative alterations, without intellect or perception disorder. The dementia-precox case is characterized by a mixture of qualitative and quantitative disorder; in both, by a splitting, such that reactions do not correspond to emotions and ideas; and by secondary symptoms of mania, depression, hallucinations, delusions, etc. Particular types have characteristic symptoms, such as the cerea flexibilitas of catatonia. But common to all are the stupidity, queerness, dulling of emotions, difficulties in thought and expression, etc., without any clouding of consciousness or delirium.

In the psychoneuroses we have to do with disorders of emotion and will, and not with intellectual disorders. Such alteration of consciousness as does occur is a narrowing of the field (Janet) and not a clouding of the entire field, as is characteristic in our first group of cases.

The dream states are particularly characteristic in this sense. In the dream state there is partial or complete dissociation of the personality, and all sorts of queer events may happen. Here we are apt to find disorientation and clouding of the existing consciousness. The differential diagnosis is then to be based on history and the reactions of the patient. The hallucinations tend to be of the scenic sort,—uncontrolled and vivid imagination. The emotional response is likely to be normal for the ideas entertained. Loss of consciousness apparently occurs, but is not really complete, since it can always be penetrated by some person or persons.

The psychopaths represent cases of abnormal make-up, the difficulties lying chiefly in the emotional and will field. Usually recognized because of conduct disorder, we find on analysis that the causes lie in improper relations of emotion and will. As a rule the intelligence is of normal level, though it may be qualitatively abnormal. Reference to various forms of sexual psychopathy very quickly proves this point.

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* Very striking is the case of a woman, 75 years of age, in her third attack of manic-depressive depression with no disturbance of consciousness and no detectable memory loss, showing the typical picture of depression, retardation and underactivity.

† A particularly striking case may be very briefly presented. This man's cerebellar tumor, as shown at autopsy, was correctly diagnosed at his second admission here. Despite the fact that his symptoms were all in the intellectual (memory loss as the outstanding symptom) and motor (speech and gait) fields on his first admission, two years previously, he had been called dementia praecox! Just previous to this he had been psychoanalyzed with —to quote his physician—"75 per cent. improvement!" A full report of this case is to appear later.

These points are so well known that they would seem to need no further elaboration.

There is one important toxic psychosis in which disturbance of consciousness is absent, the memory is intact, and the symptoms are mainly in the field of the emotions and will (with characteristic hallucinations and delusions). This is acute alcoholic hallucinosis. But the *typical* cases of this resemble dementia precox more closely than anything else; in fact, we may wonder if it is not toxic dementia precox. Here the history is of great importance in the diagnosis.

Finally, there is one great group of cases in which the disorder is chiefly intellectual, but of a particular sort. These are the paranoid states (omitting paranoid dementia precox, where the important thing is the precox disturbance). There is no consciousness disturbance and no disturbance of retention and recollection (beyond possible falsification in line with the delusions), but there is a marked judgment disorder. The emotions are chiefly exaggerations of the suspiciousness group, with at times other disturbances. The will may or may not be controlled by the ideas. These *paralogical* states occupy a position of their own, and in only a few is the etiology clear (*e.g.*, so-called alcoholic paranoia). Of those *not* dementia precox, we have paranoia, paraphrenia, jealousy psychosis (usually of alcoholic etiology) and the presenile psychosis (ideas of reference predominating). Differential diagnosis between the various types is to be based on history and symptoms.

According to my views, we need to analyze the *state* of the patient very quickly. We need to know the condition of consciousnesss and orientation, the gross memory, delusions and hallucinations, emotional tone and reactions—the latter with special reference to will disturbance. Given these facts, which can be obtained in a short interview, together with immediate history and certain physical phenomena already mentioned (neurological changes, temperature, general physical condition), we should be able at once to say in which of the several large groups here erected the difficulty lies. If the evaluation and interpretation are correct, then the case becomes one for finer differentiation within the large group. This represents diagnosis by exclusion, but not in the sense of ordinary physical diagnosis, since the state of the psychotic patient is always more complex, and the presenting symptoms more numerous than is the case with physical disease alone. The order of exclusion is important, but represents another viewpoint, which I shall not discuss.

The problem is, of course, complicated where there is no obvious psychosis present. Here the analysis must proceed to demonstrate the absence of psychosis, and determine then (*a*) whether the patient is normal or abnormal, and (*b*) if abnormal, whether it is psychoneurosis, psychopathia, or feeble-mindedness, or some other form of neurological or psychiatric difficulty.

Accurate differential diagnoses can be made only if the observations are detailed and thorough, and if the examiner interprets correctly and properly aligns the symptoms with causes. Symptomatic diagnoses should be the rule, and should be checked against outcome in every case.

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# STRUCTURAL DEFORMITIES VERSUS FUNCTIONAL EFFICIENCIES AS OBJECTS OF TREATMENTS.*

BY HERMAN W. MARSHALL, M.D., BOSTON.

PATIENTS with stiff knees can usually find some physicians who are willing to advise restorations of motions by surgical interference; and other patients with damaged knee joints, which still permit some motion, can find physicians who will advocate making such knees stiff by operative means.

Or again, straight, stiff legs may be thought less preferable than slightly flexed, rigid knee deformities; yet in other instances immovable knees already bent are straightened.

Hips, elbows, and other joints with impaired functions likewise at times are stiffened, while joints ankylosed already in other cases are made movable again.

The interesting questions that these clinical procedures raise are those which constitute the most desirable methods of treatment and the reasons involved. The answers can be made convincingly after first reviewing some of the peculiarities of the present stage of medical development.

Modern scientific methods used in medicine have revealed how erroneous and fantastic frequently were the theories and ideas held by old medical practitioners who were unscientific, and who relied so largely on their own independent observations and what was termed "common sense."

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* Read before the New England Association of Physical Therapeutics, on April 23, 1918.

Such tremendous advances have been made in the last fifty years or more,—progress previously impossible through past centuries, without exact science,—that one occasionally wonders whether there are any limits to scientific attainments, or whether there is such a possibility as too rapid growth of scientific medicine.

As past achievements are reviewed, there may be seen important medical problems solved, satisfactory broad biological and scientific preventive medical theories advanced; and in clinical practice a notable increase in numbers of special practitioners. Ranges for individual endeavor in medical practice have narrowed and deepened until newly made specialists of late have been predicting that the days of general medical practitioners have passed.

There has been so much to do in all special fields of scientific medical work, and so much enthusiasm and friendly rivalry among special workers that scientific facts have accumulated at an extremely rapid rate. In not a few instances the fascinations of making new additions to medical knowledge apparently have partly eclipsed the main consideration of medical practice, namely, the welfare of patients.

There has tended to develop under these circumstances what may be called, appropriately, *malignant scientific development,*—an abnormally rapid growth which is of benefit to medical science itself and possibly to future generations of patients, but harmful to present-day sufferers when it absorbs attention that should be given to the numerous other factors which always enter into every patient's problems.

Such excessive scientific development may be compared to the rapid growth of a malignant tumor,—development which is all right for the tumor itself, but injurious to the person who possesses the new growth. So the welfare of the present generation of patients is influenced by the rate of growth of medical science, benignly affected by moderate progress and unfavorably influenced by its extremely slow or excessively rapid rates.

Limitations of extreme scientific clinical specialists already have become so obvious at the present time that renewed efforts are being made to group them into single combinations possessing greater usefulness and of more even balance. By this procedure it is hoped that the practical common-sense judicial capacities of old-time practitioners will be included along with most specialized scientific knowledge, because it is becoming recognized more and more generally that strictly scientific methods are quite inadequate for the most successful management of numerous varied clinical difficulties encountered.

No reasons exist for supposing there ever will be a time when comprehensive judicial abilities alone or conservative scientific methods independently will be sufficient for all requirements of clinical practice; on the contrary, a properly balanced system resulting from the combination of these two opposite factors always, presumably, should govern treatments of patients.

To return to the special topic of structural deformities and functional efficiencies as objects of treatments, at the outset let it be clearly understood that deformities of themselves show results of previously acting causes; and, secondly, they may occasionally simultaneously contribute to existing pathological symptoms or be contributing causes of future peculiarities. They must not be considered origins of abnormal symptoms, when really they commonly represent only the anatomic results of previously acting causes.

Deformities may consist of mal-positions in reunited bones after fractures or congenital bony defects originating in obscure prenatal causes. They may be the results of slow changes going on after birth in muscles and ligaments, which produce round shoulders, hollow backs, lateral curvatures, visceral ptoses, and faulty postures in general; as well as the anatomic defect of flat-foot, which results from weakness of ligaments and muscles of these parts.

Diseases and peculiarities originating within bones themselves or in joints are responsible for structural peculiarities in some instances; but in this paper will be considered principally musculo-ligamentous causes for deformities.

A person's attitude, or form of his feet, or positions of his fractured bones alone, are often inadequate for judgments and treatments of functional efficiency. An individual may have a stooped posture, or a slight lateral twist of the spine, and yet be strong and vigorous, provided there have been strengthenings of musculo-ligamentous stays subsequently to developments of these structural changes. Natural physiologic hypertrophies of muscles and ligaments are the normal compensatory results of increased strain and increased use of muscles and ligaments.

A moderate postural defect in one person may have had very slow continuous development, and have reached a balanced state through compensatory musculo-ligamentous hypertrophy at the time of medical examination; while a second patient may have acquired a similar postural defect recently and rapidly, and this person, perhaps, will have back pains with the same degree of anatomic deformity as the other individual. The cause of abnormal symptoms in the second case cited is not due to the existing deformity, however, but to acute musculo-ligamentous weakness and strain.

Similar relationships exist in feet with regard to structural variations in their forms and musculo-ligamentous changes in strengths from time to time. With fractured bones it is universally recognized that good alignment of the fragments does not necessarily signify best possible function, if muscles concerned have been neglected so that their normal activities are seriously impaired.

On the other hand, it is not so very unusual to see surprisingly good function after fractures that have been surgically neglected, because muscles have increased rather than decreased in strength and usefulness in these particular patients.

Deformities are not without significance, nevertheless, and they may be of such serious degrees that compensatory muscular hypertrophies are inadequate for restorations of the normal physiological balance between the bones and their flexible stays. Certainly deformities should be treated and corrected as much as musculo-ligamentous factors in the balance of each situation indicate are likely to be needed. It is wished only to caution against destroying, or unnecessarily upsetting, fairly satisfactory functional efficiencies simply on anatomical grounds alone.

Reasons for these peculiarities of medical development are not difficult to see. Peculiarities and variations in gross anatomical structures can be observed easily, and are demonstrable to others; furthermore, the prominence and popularity of surgery has kept attention directed toward structural problems.

Musculo-ligamentous strengths, on the contrary, are uninteresting and troublesome to measure. Obscure physiological changes within living muscle and ligamentous fibers, which are responsible for changes in their strengths, have been looked upon as of interest only to laboratory scientists; and chemical and physical variations of the circulating blood which produce changes in musculo-ligamentous strengths are still imperfectly known on account of being extremely difficult to study. In consequence, naturally, the practical significance of variations in these flexible supports and muscular apparatus has not been quickly or completely comprehended.

Eventually, however, in the impartial study of all elements which enter into normal physiologic balances and into functional efficiencies there will be revealed clearly the equal importance of both structural and functional peculiarities.

Some pathologists and surgeons with strong anatomic tendencies still declare emphatically that it is dangerous to pay so much attention to mere symptom-complexes and difficultly measured functional troubles; but probably there is still greater danger in blindly ignoring the latter when directing treatments, as though these important, obscure considerations are non-existent.

What do we really know about muscles and ligaments at the present time? This question cannot be answered briefly, but if old physiological laboratory experiments which were done in medical school days, and generally promptly forgotten for more interesting clinical and surgical experiences, are resurrected, they will furnish quite a list of peculiarities of muscles, their reactions to electrical stimulation, to chemicals, to heat and cold and other physical agents. Perusal of modern textbooks of physiology will reveal exhaustive descriptions of theories of muscle fatigue and the influences of changing compositions of blood on muscle contractions. In gymnasia have been recorded averages and extremes of muscles strengths for many different groups of human muscles.

There are plenty of data upon the subject which physical therapeutists are familiar with, concerning the merits and limitations of exercises, passive motions, massage, radiant heat, various forms of electricity and so on; but the rest of us still generally need considerable additional education in these directions.

An interesting experience recently occurred to the writer in connection with some examinations of a number of Sicilian laborers who claimed to be suffering with back strains, but who were thought to be malingerers wrongly obtaining industrial accident compensation for their alleged injuries during the cold winter months.

These Italian laborers often have well-developed, hard back muscles and scanty subcutaneous fat, so that it is impossible to tell with absolute certainty whether soreness they complain of is real or feigned, and whether the muscles are normally tense or are abnormally contracted and rigid. The natural tendency of this class is to exaggerate their symptoms unconsciously, and if there are restrictions in ranges of back motions, together with alleged subjective symptoms of pain and local tenderness, the problem of discovering the real state of affairs is difficult, especially since x-rays are of so very little value in these troubles.

It occurred to me to test the lifting strengths of these patients' backs on a dynamometer, which records the maximum pull exerted in each instance. The results obtained were variable, but some patients lifted such absurdly small amounts, which they claimed were their maximum efforts, that no doubts remained in these cases as to the malingering phases of the situations.

Confirmatory evidence could sometimes be obtained, also, by testing in similar manner the strengths of other normal muscle groups, about which there were no complaints; and having already claimed weaknesses for their backs, the malingerers tried to play a safe game, and registered abnormally small maximums also for these other muscles as well.

Perhaps this experiment should be classified as detective work rather than legitimate medical endeavor; but it reveals the fact that in our thorough routine back examinations, as usually done by orthopedic specialists, we do not estimate accurately one of the principal functions of backs, namely, back strengths.

What justifications are there for fitting steel back braces, plaster jackets and, particularly, innumerable new corsets and webbing belts to anatomical peculiarities of backs, without taking into careful consideration each patient's musculo-ligamentous and physical therapeutic needs, also without deliberate judgments of general conditions and need of internal medical measures? It is true, nevertheless, many patients are tied up in orthopedic appliances simply, and apparently have very little else done for them.

What objections also are there to determining the limits of applicability of any operations that are safe and do not endanger the lives of patients?

Certainly a great deal of scientific information would accumulate if orthopedic surgeons with strong inclinations for stiffening damaged joints by operations could all plan to turn their patients over to other surgeons who believe firmly in attempting restorations of joint motions by operative procedures.

Such an arrangement would tend to increase surgical skill along these special lines, and if the second group of surgeons would refer their cases after treatment to the first group, both might always have a large supply to select from. Then if wise choices were made of patients who could afford to pay large fees, there would be adequate compensations received by the doctors for their continuous endeavors to advance medical science, and, furthermore, individual reputations might be enhanced by judicious publications of surgical results obtained. If enough momentum was attained to induce charitable organizations and institutions to become interested, then so much the better for the scheme.

The most serious drawback to this impossible plan is that patients' welfares are almost obscured and they become merely objects on which scientific surgery can develop. The illustration is given, however, to indicate that possibilities do exist for substitution of one defect for another, without great advantage to the recipients, in many instances; and this chance ought to be kept clearly in mind by all those who are concerned in the great problem of reconstruction of disabled soldiers and industrial workmen.

If practising specialists are more interested in scientific features of their profession than in individual welfares of patients, they ought to be grouped into single combinations, as has been suggested, with a responsible head who is obliged to look closely after patients' interests. Under these conditions it is possible to conceive of a very complete set of such doctors working together harmoniously, with an exceptionally well-balanced man to direct them that could accomplish results in no other way attainable; just as it is possible for the long-range German cannon to shell Paris now from an unheard-of distance at great expense, inconvenience and labor.

Let us not deny the possibilities of large pretentious groups of specialists, nor the advisability of having them for rare occasions; but let there be even greater insistence upon the fact that the enormous bulk of medical work can be done more satisfactorily by smaller groups of different kinds of special practitioners.

It is possible still for a single practitioner of average capacity to select some limited field in medicine, as, for example, affections of bones, muscles and joints, and become familiar enough with these topics to deserve the legitimate title of specialist. He can retain important personal relationships with the restricted class of patients he receives, which the older school of family practitioners maintained with their patients. It is possible for him to know advantages, limitations, and comparative merits of different therapeutic measures used in his specialty, and yet appreciate their comparatively minor values in treatment among patients who possess other ailments. In brief, he can be an old-time general practitioner within his narrow sphere, looking out for his patients' interests always, first with unusual care, and simultaneously advancing himself at a satisfactory rate in special scientific attainments.

Some patients he will treat entirely alone, while others he can send to other similar associates, one or more in a flexible manner, according to the obscurity and difficulty of individual cases. He can fit, as a consultant, into unpretentious shifting combinations temporarily from time to time for the purpose of group diagnoses upon other specialists' patients.

Altogether, this type of practitioner avoids so many of the present-day unfavorable tendencies, including dangers of over-treatment and excessive expense, that it seems that his good qualities and possibilities should be loudly proclaimed along with those of formal fixed groups.

Future time has to decide how strongly the new ideas of reconstruction among industrial workmen, sailors and soldiers will be influenced purely by surgical, mechanical, and anatomic factors; and how much can be advantageously done in fitting special structural deformities to particularly favorable industrial tasks without intervention of surgery. Both aspects deserve prolonged consideration and discussion, because there will be medical solutions of problems that are likely to oppose present ideas of labor organizations and uniform scales of wages for all workmen in each class. Variations arising from many grades of disability will necessarily make uniformity with fairness increasingly difficult, yet large numbers of partially disabled men will demand an opportunity to work as much as their abilities permit.

All practitioners of all kinds undoubtedly will give their best endeavors to the tasks ahead, and now is the time to bring forward friendly criticisms and comments in moderation. Accordingly, I wish to insist that functional efficiencies rather than structural deformities should be made the goals that are striven for.

We shall undoubtedly make progress somehow, and practical experience will point out, later, clearly where our successes and failures were made, but also at the present time we ought to try to keep the numbers of those at a minimum who are sacrificed to malignant scientific tendencies.

In conclusion, an answer to the questions suggested in the beginning of the paper will be made by the statement that each of the methods mentioned may be either right or wrong, according as they are used to increase or diminish special functional efficiencies in each patient, and depending upon the degree of success they fit each person treated to periods of future usefulness.

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# THE BEGINNING OF DISPENSARIES.*

By Michael M. Davis, Jr., Boston,
and
Andrew R. Warner, M.D., Cleveland.

In 1665, the great conflagration which devastation London brought in its fiery train a blessing, for it rid the city of plague. But the germs of poverty cannot be burned up, and the sickness and misery that follow poverty were so apparent to the public-spirited members of the medical profession of London, that in 1687, they voted that all members of the College of Physicians, their professional organization, should give their services to the poor without charge. In due form they transmitted this resolution to the Lord Mayor and Aldermen. When, however, the charitable-minded sought to call the good physicians to the service of the poor, no means was found of providing the medicines which the doctors wished to prescribe. The pharmacists of London were at that time organized as a guild, the so-called Apothecaries' Hall; and Apothecaries' Hall would not lower its prices, even when the College of Physicians requested it on behalf of the poor.

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* Reprinted, by permission of The Macmillan Company, from a forthcoming book on "Dispensaries: their Organization and Management," by the authors above named.

The physicians did not sit idle under this monopoly in the prescription market. Fifty-three leading spirits signed an agreement on December 22, 1696, to pay ten pounds apiece to Dr. Thomas Burwell, one of their number, which sum Dr. Burwell was to use for medicines for the poor. Thereupon the first dispensary in the English-speaking world was opened in the building of the College of Physicians.

### THE FIRST DISPENSARY IN ENGLAND.

During the first five years of its existence, we do not know how many patients the doctors treated, but it is recorded that 20,000 prescriptions were given out. The physicians, however, complained that the dole of medicines was more highly regarded by the public than the freely given services of the physicians. We do not find this first dispensary mentioned in Addison's *Spectator;* but if the sentiment of the educated London public could have been gauged, we should probably find that the dispensary was regarded as a medical soup-kitchen. Medicines and medical services alike were doubtless thought of as a dole to the needy.

In the seventeenth century specialists in medicine had not appeared; modern scientific aids to diagnosis were unknown, treatment was necessarily of symptoms of diseases rather than of causes. The giving of medicines played a larger part in theory and in practice than it does today. The spirit of service characteristic of the medical profession, which led the London doctors of 1696 to establish the first dispensary in the English-speaking world, is the one fine continuing element through the whole history of the dispensary movement from this early beginning.

The later history of this first London dispensary is obscure; not until the latter part of the eighteenth century are dispensaries again noticeable in London. In 1770 the so-called "General Dispensary" was started, and four years afterward, the "Westminster Dispensary"; in 1779 the "London Dispensary," in 1780 the "Flushing Dispensary" and in 1782 the "Eastern Dispensary." These institutions were supported mainly by private subscriptions, usually of one guinea; patients were accepted only when recommended by a subscriber, and it is said that they were required, when discharged from the care of the dispensary, to return thanks to the subscriber by letter. Dr. Lettsom, one of the first physicians of the General Dispensary in London, said, under date of 1801, referring to the five London Dispensaries, "50,000 poor persons are relieved annually, one-third of whom are attended at their own dwellings: a mode of relief which keeps the branches of the family from being separated and affords the wife an opportunity of nursing the sick husband, or child, or the husband to superintend and protect the sick wife. And by this mode of conveying relief to the bosoms and houses of the poor, the expense is trivial indeed, as one guinea, which is the annual subscription of a governor, affords the means of relief to at least ten patients."

Thus, during the latter part of the eighteenth century dispensaries blossomed in the English metropolis.*

Dispensaries do not appear to have been established in America until after the Revolution, but within a few years following the conclusion of peace, each of the three chief cities in the United States had, as will be seen, followed the example of London and established a dispensary.

### DISPENSARIES IN THE UNITED STATES.

The first was started in Philadelphia in 1786. The Philadelphia Dispensary still stands on Independence Square, occupying the same building which was erected in 1801 and which, with slight modifications, serves for the 30,000-odd patients who pass through it annually. In New York City the New York Dispensary was established in 1790 and, unlike its Quaker brother, has passed from one building to another, enlarging as it moved. The third dispensary in the country was the Boston Dispensary, established in 1796 at a point on Washington Street, close to the corner of Court Street, on which the restaurant known as Thompson's Spa now stands. Those responsible for the establishment of the Boston Dispensary were familiar with the institutions in New York, Philadelphia and

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* By 1850 the number of dispensaries in London is said to have increased to 35. No reference is made here to dispensaries on the Continent. They do not appear to have affected the early development of dispensaries in the United States. In the latter part of the nineteenth century, foreign clinics, in which many American physicians studied, had substantial influence upon the procedures of medical education, and thus upon some of the dispensary movements described later.

London, as the following statement, prepared by a committee in September, 1796, bears witness:

"It having been found by experience both in Europe and in several of the capital towns in America, that dispensaries for the medical relief of the poor are the most useful among benevolent institutions, a number of gentlemen propose to establish a public dispensary in the town of Boston, for the relief of the sick poor; which they presume will embrace the following advantages:

"1. The sick, without being pained by a separation from their families, may be attended and relieved in their own houses.

"2. The sick can, in this way, be assisted at a less expense to the public than in a hospital.

"3. Those who have seen better days may be comforted without being humiliated; and all the poor receive the benefits of a charity, the more refined as it is the more secret."

The benevolent desire to help the sick poor thus appears in these quaint phrases as the primary motive leading to the establishment of this institution, and it was indeed the underlying and typical motive behind all the early dispensaries. The London system was followed in all the three earliest American dispensaries, requiring that patients be accepted only when recommended by subscribers, printed forms being furnished those contributing five dollars or more a year. In Boston, a subscriber might keep two patients under care for each five dollars annually contributed. The aim was to give the subscriber a spiritual return for his money as well as to insure "worthiness" in the applicant. That the "worthiness" of the applicant was emphasized, appears from the rule which was certainly followed in Boston and probably elsewhere, "That persons suffering from venereal disease or from the effects of alcohol should not be treated by the dispensary, as being the victims of their own sensual indulgence."

The early Boston Dispensary consisted merely of a drug store, and the physician was to be in attendance daily except Sundays. Ambulatory cases might see him there at 11 o'clock. Patients too sick to come for treatment were to be visited at their homes and to a certain extent these eighteenth century dispensary physicians saw patients at their private offices without charge. Almost the sole elements of expense in the early days were the medicines provided, and of these, at least at the Boston Dispensary, wines or spirits were the largest items among the treasurer's bills. The method of the early dispensaries was simply this: a poor patient had to have a letter from a subscriber, and must present this at the dispensary during the announced hours; or the letter of recommendation might be left by some friend or member of the family with the apothecary, so that the doctor should have the name and address, in order to call at the sick person's home. At first only one physician at a time was furnished. Dr. John Fleet, the first physician of the Boston Dispensary, for instance, treated 80 patients during the first year. As the city grew in size, more physicians were added and the city was divided, each physician seeing patients only within his own district.

In New York additional dispensaries were founded early in the nineteenth century, the Northern Dispensary (still in existence) in 1827, and the "Eastern Dispensary" in 1832. The city was then more or less equally divided between them. As the communities became larger, the earlier system of recommending patients through subscribers became increasingly inconvenient and was gradually given up. Dr. Oliver Wendell Holmes, a physician of the Boston Dispensary in 1837, complained in a letter to the Board of Managers that the physicians of the dispensary were practically compelled to secure tickets signed in blank by subscribers. The patients usually appealed to the physician in the first instance, and the rule requiring that they then go to the subscriber and secure a recommendation for treatment became merely vexations. The London dispensaries and the New York Dispensary had already established clinics on the modern principle by which the physician treats ambulatory cases at a given time and place, not in informal conferences at the apothecary shop. Thus the system of recommending patients by subscribers fell into disuse and was finally abandoned, and clinics as we know them today were developed. The Boston Dispensary started these clinics in 1856.

A new element which powerfully reinforced the charitable desire to help the sick poor appeared in the dispensary movement during the first part of the nineteenth century, namely, the interest of physicians in acquiring medical experience and in teaching medical students at a clinic. In connection with the Boston Dispensary students were allowed to attend patients almost from the beginning, as regulations governing the activities of students appear in the records as early as 1827. The development of clinical teaching in the latter part of the nineteenth century, instead of mere didactic instruction, has been one of the most powerful factors in increasing the number of dispensaries and improving their work. Oliver Wendell Holmes wrote a report to the Boston Dispensary in 1837, after he had been one of its district physicians, and urged the establishment of a clinic, saying:

"A consulting-room well attended is one of the most valuable schools for students, as well as practitioners of medicine, since many cases of disease may be seen within a very limited time; and, being thus collected, may be compared with and illustrate each other. This is one of the legitimate ends of all medical charities."

Very much more recently we see the charitable motive and the teaching motive balanced in the utterance of Sir William Osler, in his address at the opening of the new out-patient building of the Cardiff Hospital, in 1908:

"That an out-patient department is simply for the relief of the poor—the common idea—is to take an altogether too narrow view of its functions. . . . Of course the first and most important (function) is the relief of the poor. . . . In acting as the training school for the younger members of the profession, the out-patient department fulfills its second great function. . . . With sufficient staff, there is no reason why just as careful notes should not be taken in these rooms as in the wards; and let me remind the younger physicians in the audience that some of the most brilliant reputations in the profession of this country have been built up upon the solid foundation of notes taken in out-patient departments. Let me urge you to make ample provision for your medical students in the out-patient department, where they see the patients in their native state, so to speak, before they have been scoured and cleansed by the nurses in the ward."

The two motives we have thus analyzed, to do charity and to advance medical knowledge and education, are responsible for the establishment and development of probably a thousand dispensaries in the country today. During the last fifteen years, a new force or motive has supervened—from the public health field. Each of the chief militant public health movements of late years has led to the establishment of a number of dispensaries as part of its program to prevent, treat or control some disease or group of diseases. The movements to combat tuberculosis, infant mortality, mental disease, venereal disease, are instances in point, and about 1500 public health dispensaries have been founded as a result. From small beginnings, the dispensary movement has assumed much larger proportions in recent years. In 1800 there were three dispensaries in the United States. In 1900 there were about 100. The number is 25 times as great today.

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## THE RELATION OF THE DUCTLESS GLANDS TO GYNECOLOGY: PHYSIOLOGICAL AND THERAPEUTIC.*

By Alice H. Bigelow, A.B., M.D., Boston.

The present paper owes its origin to a burst of enthusiasm over an impressive and fascinating book on the ductless glands by Falta of Vienna, translated by Meyers of Philadelphia. I have tried to gather from its substantial pages the material which bears on gynecology, and to this I have added modifications and suggestions found in recent magazine articles by American authorities in the same line of research.

One by one, the organs comprising this system have been recognized as having some function other than their obvious ones; their removal or overactivity has caused symptoms uniform enough to lead to laws, till at last they have been grouped into a family of recognized standing. Some of them produce secretions that can be seen and recognized; and, in addition, other forces that are known only by their results. These latter are known as the internal secretions, or, better, by the picturesque Greek *hormones*, or messengers. They are passed directly into the blood stream, and hence are not seen at work, but are judged as to efficiency only as the goods they carry are, or are not, delivered. Adrenalin—product of the medulla of the suprarenals—is the only hormone that has been isolated.

The members of this glandular family are as follows: thyroid, parathyroid, thymus, pituitary or hypophysis (anterior and posterior lobes), pineal or epiphysis, ovaries and testicles, suprarenals (cortex and medulla), and the islands of Langerhans in the pancreas. The interaction of this chain of glands is amazing. Some work at the same time directly with some of the others and directly against the rest. Any given one will coöperate with some of its family and inhibit the others; or—to put it in familiar mathematical terms—vary directly with some, vary inversely with the others. Classification of their activities is based on their effect on metabolism. Some are acceleratory and, by hastening the body processes, make for katabolism. These are the thyroid, ovaries and testicles, posterior lobe of the pituitary, medulla of the adrenal. Others retard the constant breakdown of the tissues and so are classed as anabolic. These are the parathyroid, anterior lobe of the pituitary, suprarenal cortex, and probably thymus and pineal. To save this classification from being purely academic, look at a few familiar examples. The thyroid is classed as katabolic because it accelerates body processes; shown easily because its hyperfunction in goiter gives excitability and tachycardia. In this katabolic class is placed also the medulla of the adrenals. It excites the sympathetic system and breaks down glyocgen, hence the fleeting glycosuria of students in examination, and soldiers going up for medical inspection. In the anabolic class is placed a substance now in the white light of scientific inspection,—that of the pancreatic islands of Langerhans. It is known to conserve glycogen; and, when on strike, to lose it; hence the charge laid upon it of a share in the diabetic process. The reader of this classification notes, perhaps with surprise, that portions of some of the organs named work at variance with each other. We cite the anterior and posterior lobes of the pituitary and the cortical and medullary parts of the suprarenal.

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* Read before the New England Women's Medical Society, April 18, 1918.

The ductless gland system is supplied chiefly by the sympathetic nervous system, and its nervous influence is, in turn, mostly upon the sympathetic system. The hormones tend to accelerate the sympathetic nerves, and each shows predilections for special nerves—the most familiar affinity being that of the posterior lobe of the hypophysis for the innervation of the uterus. The increase in the general vitality of the individual at the time of ovulation, especially if the ovum become fertilized, is set down as a sympathetic stimulus by the internal ovarian secretion; and the vasomotor disturbances of the menopause are laid to the loss of the same regulating hormone. The so-called climacteric changes that sometimes occur in the male are placed in the same class.

The last general remark concerning this system regards its determining relation to the general make-up—to avoid the more subtle term "diathesis"—of the person. Where the sympathetic nervous system is sluggish, there the activities of these glands are minimized, and we find an asthenia, with sluggishness of most of the organs, enteroptosis, and constipation. With an irritable sympathetic system we are apt to find definite manifestations of glandular activity, such as swelling of the thyroid with pregnancy, almost amounting to Graves' disease, to short and sudden changes in body weight, to functional dysmenorrhea. For those in whom the balance throughout this system is well maintained, the author reserves the happy phrase, "enviable equilibrium."

I will now deliberately narrow the field to the influence of these interesting glands upon conditions of a gynecological nature, with the object of deducing, later, some practical therapeutic conclusions.

An important and complicated relation of these glands is with the secondary sex characteristics. These are accepted as meaning all differential points of sex anatomy and physiology except those immediately concerned with reproduction. Attention was first called to this relation by the obvious body changes following castration and oöphorectomy. Bodies other than the testicle and ovary are now known to share in determining these characteristics.

To begin with the less important members of the series, we may make a few interesting notes. First: that the parathyroids control nerve and muscle activity to such a degree that their inactivity is now held responsible for many forms of tetany, especially that which occurs in pregnancy. Administration of the gland, however, has not cured the condition, leaving the theory still in laboratory form. Second: that the thymus, largest at birth, atrophies at puberty. Its function seems to vary indirectly with sexual activity, because it ceases to act when this begins and, on the other hand, in eunuchs it is large and presumably active. In the condition of acromegaly, caused by hyperfunction of the pituitary, external sex markings are exaggerated. Body hair becomes heavy and profuse, virile in women, and the external genitalia are hypertrophied. Colostrum sometimes appears. Menstruation and conception may or may not take place. Conversely, with hypofunction of the pituitary, we find a loss of body hair, an increase of fat which blurs the characteristic body outlines of sex, and a retrogression of sex functions and glandular tissue. In the female dwarf, when the cause lies in the pituitary, we find, as we should expect, infantile genitalia and amenorrhea.

The more familiar thyroid is placed physiologically in the class with the ovary; but the neat classification which we are tempted to make, of excessive menstruation on the one hand, and amenorrhea on the other, according as the gland is over- or under-active, is not supported by clinical facts. Everyone admits that thyroid disturbance shows in menstrual phenomena. Osler says that there is no uniformity in the menstrual disturbance as to regularity or amount. In some instances the thyroid is known to vary directly with pelvic activity, when it enlarges during pregnancy and with the periods. Novak of Baltimore says of it that, taken by and large, menstruation is more apt to be scanty or absent with thyroid hypertrophy in Graves' disease, and increased by its atrophy in myxedema. Hence we must add thyroid disturbance to our list of causes for amenorrhea as we meet it clinically. That list stands as follows: pregnancy, menopause, anemia, recent immigration, tuberculosis. If we bear the thyroid in mind, we may find an obvious goiter and its syndrome of tachycardia and tremor, or a myxedema, with dry, shiny, hairless skin, and a bloated body outline. In the latter case thyroid extract by mouth tends to act with charming accuracy.

An allied form of functional amenorrhea is due to pituitary insufficiency. These patients are frankly fat, often distressingly obese. The condition staggers under the technical description of "adiposo-genital dystrophy," or Froelich's syndrome. We are accustomed to associate obesity with amenorrhea. Once its relation was supposed to be causal; now both are known to reach back to some deeper cause common to both. This discovery has put a ban on the emmenagogue drugs, which can cause only pelvic congestion and distress, and thrown the thoughtful physician back on the logical use of gland tissue. Administration of the pituitary body itself has not helped much, but the thyroid gives a reliable preparation which is favored by Novak in conditions where the pituitary is deficient, as well as the ovary or the thyroid itself. He considers thyroid extract the safest and most stable gland preparation, and uses it in doses of gr. V a day, watching for tachycardia, tremor, or serious loss of weight. Sometimes he supplements it with corpus luteum.

Before discussing the ovary as a ductless gland, one statement must be made as a summary of the foregoing, namely, that the ovary is a less important member of the family than has been supposed, and owes much to its coadjutors, the thyroid and portions of the adrenals and pituitary.

Even more recent and precise than the work we have been reviewing is the research on the ovary published by Graves of Boston in the *Journal of the A. M. A.* of Sept. 1, 1917. He begins with a frank statement of the facts concern- the ovary which we should like to know and don't; its relation to menstruation; the relation, in turn, of menstruation to ovulation; the function of the internal secretion, whether it be direct or only regulating; the portion of the ovary creating that subtle product; and the very reasonable question as to whether there may not be two of these products.

That the corpus luteum does make an internal secretion is so generally accepted that it is called by many "an organ of internal secretion." This phrase, Dr. Graves points out, is histologically inaccurate, because the secreting cells of the corpus luteum are duplicated in cells scattered throughout the body of the ovary and known as the interstitial cells. Hence he argues that the entire ovarian tissue takes part in producing the hormone; and because ovarian activity is seen in youth, before the corpus luteum is mature, it seems likely that the primary source of the secretion lies in the interstitial cells rather than the special cells usually credited with it. The similarity of these interstitial cells to the cells of Leydig in the testicle, which is admitted to have its own hormone, is another argument against the exclusive activity of the corpus luteum.

He has not found therapeutic preparations of the corpus luteum stable or uniform because made during different stages of its life. They have been inert on the one hand, and toxic on the other, giving nausea for a week or more. Preparations from the whole ovary, however, have been found more reliable and have given good results, especially when taken from a pregnant animal. He has used them successfully in the vasomotor disturbances of the menopause, natural and artificial; in functional amenorrhea; in amenorrhea of thyroid origin; menstrual headache; kraurosis, and senile pruritus. Success with kraurosis is interesting because it supports the theory that the interstitial cells are the trophic control for the genital tract.

Armour's preparation of the whole ovary in five-grain capsules was the form used.

Dr. Graves' contribution consists in shifting the emphasis of value from the corpus luteum to the cells in the body of the ovary, and he has supported his theory still further than the above description by giving ovarian preparations with the corpus luteum excluded, with results as satisfactory as those procured by the whole organ.

Reflection on these considerations seems to urge the physician who handles many women to look at the pelvis no less carefully, but to look also at the patient as a complicated whole; to avoid chemical interference with body processes of an origin deeper than we used to think; to listen at the laboratory door for suggestions as to how we may catch nature at work and imitate her. If, as teachers of women, we can attack the ancient tradition that centers their thought of themselves too strongly in the pelvic organs, we shall help them greatly toward that happy condition, named adequately by Falta an "enviable equilibrium."

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## Book Reviews.

*A Text-Book of Organic Chemistry.* For Students of Medicine and Biology. By E. V. McCollum, Ph.D., Professor of Agricultural Chemistry, University of Wisconsin. New York: The Macmillan Company.

In a comparatively brief work, though not approaching the meagerness of the Quiz Compends, the author has attempted to present the subject of organic chemistry for students of medicine and biology. Beginning with the simplest of the organic compounds, consisting of two elements only, he has built up the more complicated structures much as a child builds houses from blocks.

The subject of isomerism, that "pons asinorum" of all medical students, has been treated by the author in a new and rather novel way, which ought to deprive the subject of some of its difficulties.

The alcohols, ethers and esters are considered largely from a purely scientific standpoint, with very little reference to their enormous importance in biochemistry. It would seem only fair that a work which assumes to be adapted to medical students, should at least show more intimately the relation between organic chemistry and medicine, and not leave it to the reader to make these inferences and draw his own conclusions. Then, again, much material has been included which has little or no relation to medicine and biology. Whether the persistent, continuous use of formulae in place of verbal explanation is a desirable one for young students will still remain somewhat in doubt. No laboratory work is included, and the perusal of this work for the acquisition of knowledge would be about as interesting as the perusal of Webster's Unabridged.

On the whole, apart from its brevity, it does not seem to be any improvement over the numerous other works on organic chemistry which do not contain this special appeal to devotees of medicine and biology.

*The Sex Complex.* By W. Blair Bell, B.S., M.D., Lond. New York: William Wood and Company.

According to its sub-title, this monograph, based on the author's Arris and Gale lectures of 1913, is "a study of the relationships of the internal secretions to the female characteristics and functions in health and disease." It aims to demonstrate "that the reproductive functions are directed and controlled by all the organs of internal secretion acting in conjunction, rather than by the gonads alone, as formerly thought." This correlation of the internal secretions with regard to the sex functions is indicated by the term "sex complex."

The work is divided into two parts, the first dealing with morphologic, physiologic, and psychologic; the second with pathologic considerations. The author discusses successively the primary and secondary female sex characteristics, the function of the ovaries, and the relations of the thyroid, pituitary, suprarenals, and pancreas to the genital system. The outbreak of the European War prevented the completion of work on the parathyroids, pineal, and thymus, which are, therefore, but briefly considered. The second part deals clinically with derangements in the structural and functional development of the genital organs and of the fully established female characteristics and functions, as well as with sexual and reproductive psychoses and neuroses. An appendix states briefly the physiological effects of extracts of the endocritic organs. The volume is a valuable contribution to the philosophy of their action.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

## MEDICAL SECTION OF THE COUNCIL OF NATIONAL DEFENSE.

THE recent visit to Washington for the Conference of the Council of National Defense, Medical Section, so impressed the seven members of the Massachusetts State Committee who attended it, that a few words regarding it may not be out of place.

To those who had not seen it before, the sight of the whole country at work, and at top speed, was indeed inspiring. From Boston to Baltimore a long double line of factories, foundries, munition plants and shipbuilding establishments cover the land, having sprung up over night and still growing; the train passes between two unending rows of them, like battalions of a far-flung army. Throughout the twenty-four hours the hundreds and hundreds of thousands of workers toil within them; they are literally pillars of smoke by day and of fire by night.

Washington itself is transformed. One hundred and fifty thousand men and women have been added to its normal population. Everywhere are new buildings, offices and barracks. Seventeen thousand are working for the Council of National Defense alone: men who have come from every corner of the country. They have given up business, family and salary—no, not all salary, for though they never limit themselves to an eight-hour day, they are paid one dollar a year by the Government. They are lawyers, bankers, business experts, men of affairs, chemists, engineers, professors, doctors and social workers. And their spirit is only the index of the spirit of the country at large: they have forgotten previous miscalculations or misconceptions, working with all their strength and mind and enthusiasm for one great end.

The meeting of the State Committees brought doctors from every State in the Union, from Maine to the Gulf, and to the Pacific Coast. Immediately after the roll call, the impressive oath of allegiance to the United States was administered to all present. Every fact of present importance, as well as outlines of essential plans for the future, were then laid before us by various heads of departments and other high officials. All the innumerable reports and addresses may be summarized from our standpoint in one sentence—"More doctors, more doctors, more doctors, for the Army, Navy and Public Health Service." There is no limit set to this number, as Secretary Baker recently said in relation to the fighting men.

As a result of all that was presented on Saturday and Sunday, May 4 and 5, it is obviously the ideal thing at this moment that every doctor in the United States who is not yet fifty-five, should offer his services to the country *now,* and without reference to institutional or to community needs. If every one of the one hundred thousand of these men would at once apply for and accept a commission, the entire complex and urgent problem of the future medical needs of the fighting forces would vanish into thin air. The War Department could then, with advice and counsel, call immediately those whom it most needs; and assign the others, at least for the present, to local and imperative civil positions and tasks, often to continuing to do what they are and have been doing; and if any of those accepting commissions desire immediate service, a personal request to the Surgeon-General will secure it within a few hours. This is the ideal!

However, if this universal medical service must yet be held a short time in abeyance, at the very least every doctor who can possibly go into service should apply at once; now is the acceptable time; fifty-five years is still the limit as to age. But it must be remembered that the best and fairest flowers of the over fifty group have already been culled; they are at this moment working twelve hours a day, and more, in France, bearing as uncomplainingly as the fighting man their share of rain and cold and mud; or they are stationed at the various posts and camps throughout these States, doing their allotted tasks quietly and effectively. It is obvious that a considerable majority of the *five thousand* now urgently needed must be under fifty, since these are the ones who can most easily withstand the army work. Massachusetts' immediate minimum quota is *three hundred and sixty,* but in reality she should send, and send at once, at least *five hundred.*

It has not been the tradition of Massachusetts in the past to range herself in the rear rank when patriotic duty is demanded. And in this war she has done, as usual, more than her share in sending fighting men to the ranks; and has contributed more than her allotment of dollars to Liberty Loans, to the Red Cross funds, and to the other numberless appeals for works of humanity and mercy. Shall it be said that in medical loyalty alone she remains behind? That the most merciful of the professions, to whom the call came first of all, is still backward? It may be true that at present Massachusetts need not hang her head in deep shame over either the number or the quality of the doctors she has given, but it is also true that she cannot hold it proud and high, for until now she has done in this field but a scant and cautious duty. It is not the habit of Massachusetts to allow thirty other States to precede her in volume of public service, yet today she stands thirty-first in the proportion of doctors sent to the war. This must not and shall not be! Let every man who can possibly do so apply for a commission at once; let them come in such numbers that before the great holiday in the first week of July arrives, Massachusetts shall have abandoned her present position of rear guard, and in her loyalty to the care of the fighting man shall have assumed once more the place which she has always before held; the only place appropriate for one of the original American colonies—the place at the head of the column, among those who lead by action and by example; one of the elect, the chosen Twelve Apostles of the States.

At a dinner given at the Army and Navy Club, to the States Committees, Dr. William Williams Keen, past his eighty-first birthday but dressed in khaki, made a speech so fired with patriotism and eloquence, that it might well be repeated at every medical meeting in the country. He used a singularly beautiful figure, "the inspiration of disaster." He referred obviously to Russia, the small nations, and the Western drive. He said in substance:

"We have felt and have known the 'inspiration of disaster'; our eyes and our ears are opened; it now remains for us to resolve and determine with every ounce of our strength, and every power of our being, that no sacrifice is too great, no effort too intense, to wipe out completely all that now intervenes between us and ultimate, adequate victory."

Physicians of Massachusetts, come forward!

MASSACHUSETTS STATE COMMITTEE
OF NATIONAL DEFENSE.

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## REST IN CARDIAC INSUFFICIENCIES.

PERHAPS the only therapeutic measure that is applicable to all forms of cardiac insufficiency or in cardiac decompensation, with equal value, is rest—generally absolute rest in bed. In fact, no other form of treatment is of any avail unless accompanied by rest in bed. Heart stimulants administered to such patients who are not at rest can do more harm than good. In acute decompensation the rest must be absolute, no matter how long it takes for compensation to reassert itself. In individuals in whom a break in compensation is imminent or where recovery from decompensation has just occurred, the rest treatment need not be so absolute, but can consist merely in total abstinence from all forms of work or fatiguing activity or exercise. Rest is intended to diminish the burden on the heart merely to that necessary to keep the circulation alive; it must not be used for the added needs of circulation during activity. With rest properly maintained, no other form of treatment is usually necessary. In children rest may have to be maintained for months, and for a very long time after compensation has again been established. In children, rest in bed serves the double purpose of reëstablishing compensation and preventing recurrences of the acute disease the basis of the cardiac condition. In the aged, the question of maintaining absolute rest over long periods when there is myocardial degeneration is a mooted one. Of course, there is the objection of encouraging the production of hypostatic congestion in the lungs. Moreover, the lack of any exercise in aged myocardial cases may encourage further degeneration of the heart muscle. Yet, in any case, it is probably better to err on the side of too much rest than too little of it. Much of the danger of too little exercise may be overcome by passive exercise, resistance exercises and massage. The time for these exercises, the quality and the amount must be determined in each case. In the very acute decompensations not even these indications for keeping up the nutrition of the heart and the circulation can be carried out. For severe cases long rests periodically are absolutely necessary, and although this is making of these patients chronic, helpless invalids, it is the only way of keeping them alive and comfortable. Where climatic conditions are good, the rest treatment maintained out of doors is much more pleasant than elsewhere. The amount and quality of rest forced upon young cardiacs will often determine their future behavior toward cardiac insufficiency. The essential difference between the normal heart and the heart with decompensation is in the reserve force. Normal hearts have little actual force but a great deal of reserve force; abnormal hearts have much actual force and little reserve force. The latter need much actual force to drive the impeded blood current. Prolonged rest treatment will increase this reserve power so that it will be there to act when called upon, instead of, in the absence of sufficient reserve power, a break in compensation resulting from the extra burden put on the heart.

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## THE ARIDITY OF HEATED ROOMS.

High atmospheric temperatures are better tolerated, within limits, as the relative humidity of the atmosphere is lower. That this is so is due to the fact that evaporation from the skin is in inverse proportion to the degree of humidity. On the other hand, an over-dry atmosphere, where the relative humidity is very low, is extremely irritating to the mucous membranes and encourages catarrhal affections. Very dry atmosphere on the outside brings with itself, of course, dust, which adds to the irritation. Heated rooms in which there is an inadequate provision for ventilation are most likely to suffer from an artificial aridity. This occurs at any time when there is no replenishment of the moisture used up by the heating appliances. In the very poor homes, where the problem of heating is a difficult one because of the money outlay or from fuel shortage, perhaps but one room is heated, and superheated, and no provision is made for ventilation because it is not desired to waste any of the heat. Both the temperature and the atmospheric dryness are likely to be excessive. The tendency to catarrhal affections under these circumstances is illustrated by statistics that show that catarrhal affections and pneumonia increase during the months of artificial heating and lessened ventilation. The connection between pneumonia and adverse atmospheric conditions of heated rooms is suggested by the benefit obtained in the treatment of pneumonia in the open air, even when the temperature is very low.

The weather bureau (Topeka, Kansas, 1909-1910) pointed out that in winter, steam-heated offices with good ventilation maintained at an average temperature of 72° F., had an average relative humidity, as determined by the whirling psychrometer, of 23%. At the same time the outdoor humidity was 82%. The average relative humidity of Death Valley, California, in the summer of 1891, was 23%. In such well-known arid places as Yuma, Arizona; Santa Fe, N. M.; Pueblo, Col., the average relative humidity, even during the dryest seasons, did not exceed 35, 29, and 38%, respectively. Indoor heating during the winter can make the air drier than a desert, and there is small wonder that catarrhal conditions in Northern cities are almost universal. Besides proper ventilation of heated rooms and the regulation against overheating, it is necessary to replenish in some method the moisture taken up by heating, otherwise places become not only uncomfortable but render the occupants likely to catarrhal conditions. The work of the New York Board of Health for the encouragement of open windows during the winter has done much to reduce the incidence of pneumonia.

## LOW PULSE PRESSURE.

While a great deal of attention is justly paid to high blood pressure, its causes, prevention and treatment, the possibility of low blood pressure being a pathological factor is often quite overlooked. Low pulse pressure is an important and cardinal element in mitral insufficiency after severe infectious diseases as well as after severe hemorrhage, but may occur irrespective of either of these conditions, and is always a difficult condition with which to cope. Low pulse pressure of the idiopathic type is most frequently associated with inanition, asthenic conditions, neurasthenia, and the pretubercular state. Just exactly what is the basic condition in low pulse pressure—hyposphyxia—is difficult to say. In the light of the newer studies into the functions of the glands of internal secretion—the endocrinous system—it is quite likely that low blood pressure has much to do with some disturbance in this system. The whole vasomotor control and the nutrition of the blood vessels is under the control of the sympathetic nervous system, which, in turn, is very closely associated with the glands of internal secretion. With the lowered blood pressure there is a diminished arterial output, general circulatory sluggishness and venous stasis. Failure of general body nutrition and deteriorative physical and mental effects are the end-results. There is diminution in all body secretions, lessened blood-making powers and an increase of the blood viscosity, although there is a lowering of the hemoglobin content. The failure of digestion is the natural consequence of the diminished digestive secretions. All these conditions are more often exemplified in the obese, pale and flabby type of individual. It is the same type in whom disturbance of the glands of internal secretion, especially of the pituitary, is commonly met.

The indications for treatment are not so much the increase of blood pressure, as an attempt to remedy causes when possible. Naturally, organotherapy has received a great deal of attention. Not merely the pituitary gland, but the thyroid, ovarian and epinephrin extracts have been tried. Pluriglandular treatment is often better, no matter if the particular gland disease can be localized, because of the close relationship of the whole system. When there is disturbance in one, all the others of the system are likely to be affected. Improvement in the general mode of life, the administration of appropriate stimulants, tonics and hematinics are important elements of treatment. Massage and gradually increased exercise not only benefit muscular tone but, by helping to empty the blood vessels in the muscular tissues, improve the general circulation.

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## NAVAL RESERVE NEEDS MALE NURSES AND PHARMACISTS.

There are several desirable openings in the Hospital Corps of the United States Naval Reserve Force for men between the ages of 18 and 28, who are citizens of the United States. Young men who desire to take up a calling where a satisfactory wage is obtained immediately and where there is every opportunity for advancement, instruction, education, and pleasant duty, or who contemplate the study of nursing or other allied subjects, are invited to consider the Hospital Corps as a field for employment or elementary training. Graduates of training schools for nurses of hospitals, or men who have served as attendants in hospitals, or in institutions, and pharmacists, will find in this branch of the naval service an opening to pursue their chosen profession with added training and inducement. Referring to the duties in brief: hospital corpsmen act as nurses to the sick, administer first aid to accident cases, assist at surgical operations, care for the medical stores and property, compound medicines, and attend to the clerical work of the department. For enrollment in the Hospital Corps, U. S. Naval Reserve Force, apply in person at the office of District Medical Aide, Room 1210, Little Building, Boston, Mass.

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## MEDICAL NOTES.

Result of Vaccination against Pneumonia.—At the opening session of the American Society for Clinical Investigation, Atlantic City, N. J., Dr. Russell L. Cecil, of the Rockefeller Hospital, New York, announced that the adoption of prophylactic vaccination had reduced the number of cases of pneumonia in a military camp to seventeen among twelve thousand vaccinated, as compared with one hundred and seventy-three cases among nineteen thousand men who had not been treated with the serum.

THE ILLEGITIMATE BABY'S RIGHTS.—The rights of illegitimate children and the State's responsibility for seeing that every child, no matter what his parentage, has the nurture, protection, and education essential to his usefulness as a citizen, are for the first time given complete national recognition in the Norwegian laws concerning illegitimate children, accordig to a report issued May 23, by the Children's Bureau of the U. S. Department of Labor.

These laws make the State instead of the mother responsible for establishing paternity. The State holds both parents equally and continuously responsible for the illegitimate child: "The child shall be entitled to bringing up—maintenance, training, and education—from both its father and its mother." The report contains a translation of the several Norwegian laws, with amendments, on illegitimate children and their care. A history of the efforts through which the legislation was secured is given in the introduction.

The attitude which looks upon illegitimacy as a child-welfare problem that must be solved for the sake of the child and of the State is exemplified by this Norwegian legislation. In connection with its studies of the bearing of the war upon child welfare, the Children's Bureau examined the evidence obtainable but could not find that it justified the statements that have been circulated of widespread increase in illegitimacy since the war. The Bureau believes, however, that the needs of the illegitimate child must be considered in the Children's Year campaign "to save 100,000 children's lives during the second year of the war and to get a square deal for children." In the Children's Year Working Program attention is called to the necessity of providing opportunity for normal development to the child of unmarried parents.

RED CROSS WEEK.—President Wilson has issued a proclamation designating the week beginning May 20 as "Red Cross Week." The American people are earnestly called upon to contribute generously to the second $100,000,000 war fund of the American Red Cross, for the alleviation of suffering among both the American and Allied troops in France and the civilian population at home and in the Allied countries. By this means, not only will it be possible to continue the important work of relieving distress, but it will also assist in maintaining the morale of our own troops and the troops and people of our Allies, "by this manifestation of effort and sacrifices on the part of those who, though not privileged to bear arms, are of one spirit, purpose, and determination with our warriors."

### WAR NOTES.

APPROPRIATION FOR ARMY NEEDS.—The War Department has asked Congress to appropriate $33,000,000 to provide for the medical necessities of the new forces about to be assembled under the new draft.

HEALTH OF THE ARMY.—Health conditions in the army posts and training camps in the United States showed a marked improvement during the week ending May 3. All sick rates continued to decline, with the exception of measles. The total number of deaths was 188, compared with 251 the week before.

WAR RELIEF FUNDS.—On May 18, the totals of the principal New England War Relief funds reached the following amounts:

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| Belgian Fund | $671,205.28 |
| French Wounded Fund | 361,996.34 |
| Armenian-Syrian Fund | 305,123.97 |
| French Orphanage Fund | 179,066.91 |
| Italian Fund | 170,737.46 |
| British Imperial Fund | 119,645.67 |
| LaFayette Fund | 36,351.29 |

INCIDENCE OF VENEREAL DISEASE IN THE AMERICAN ARMY.—An unofficial report from France on May 12, attributes to Major Hugh H. Young a statement that among the American Expeditionary Forces now in France, the incidence of venereal diseases thus far, requiring hospital treatment, has been only one-tenth of one per cent. This figure is considerably lower than was expected or than has been suggested by earlier reports, but it is to be remembered that the first statement is not necessarily authentic or authoritative.

### BOSTON AND MASSACHUSETTS.

SOUTH ESSEX MEDICAL SOCIETY.—At the annual meeting of the South Essex Medical Society, ex-Lieutenant Governor Grafton D. Cushing described conditions in France. Dr. James J. Egan, of Gloucester, was elected president for the coming year; Dr. Carolus M. Cobb, Lynn, vice-president; Dr. Hamlin P. Bennett, Lynn, secretary; and Dr. George Z. Goodell, Salem, treasurer.

WEEK'S DEATH RATE IN BOSTON.—During the week ending May 11, 1918, the number of deaths reported was 234, against 278 last year, with a rate of 15.86, against 18.77 last year. There were 42 deaths under one year of age, against 39 last year.

The number of cases of principal reportable diseases were: diphtheria, 64; scarlet fever, 40; measles, 385; whooping cough, 63; typhoid fever, 3; tuberculosis, 94.

Included in the above were the following cases of non-residents: diphtheria, 10; scarlet fever, 8; measles, 3; tuberculosis, 14.

Total deaths from these diseases were: diphtheria, 1; scarlet fever, 2; measles, 8; whooping cough, 5; typhoid fever, 1; tuberculosis, 34.

Included in the above were the following non-residents: scarlet fever, 1; tuberculosis, 6.

Smallpox: 2 cases for week, both residents of Boston.

## The Massachusetts Medical Society.

NOTICE OF REMOVAL.—On May 22, Dr. Walter L. Burrage, Secretary of The Massachusetts Medical Society, removed from 282 Newbury Street, Back Bay, Boston, to 42 Eliot Street, Jamaica Plain, Boston, between Center Street and Jamaica Pond Parkway. Telephone, Jamaica 469.

## NOTES FROM THE DISTRICT SOCIETIES.

### DISTRICT CORRESPONDENTS.

*Berkshire*, A. P. MERRILL, M.D., Pittsfield.
*Bristol North*, ARTHUR R. CRANDELL, M.D., Taunton.
*Bristol South*, EDWIN D. GARDNER, M.D., New Bedford.
*Essex North*, T. N. STONE, M.D., Haverhill.
*Essex South*, H. P. BENNETT, M.D., Lynn.
*Hampden*, LAURENCE D. CHAPIN, M.D., Springfield.
*Hampshire*, E. E. THOMAS, M.D., Northampton.
*Middlesex South*, WILLIAM C. HANSON, M.D., Belmont.
*Norfolk South*, DANIEL B. REARDON, M.D., Quincy.
*Plymouth*, ALFRED C. SMITH, M.D., Brockton.
*Worcester*, ERNEST L. HUNT, M.D., Worcester.

WORCESTER DISTRICT MEDICAL SOCIETY.—Officers elected for 1918-1919: President, Dr. W. L. Johnson, Uxbridge; vice-president, Dr. William J. Delahanty, Worcester; secretary, Dr. George A. Dix, Worcester; orator, Major Kendall Emerson, M.R.C., Worcester. Committee on Funds, Dr. O. H. Everett, Worcester; Dr. Homer Gage, Worcester; Dr. David Harrower, Worcester. Commissioner of Trials, Dr. George F. O'Day, Worcester.

Councilors: Dr. W. P. Bowers, Clinton, president; Dr. Frank Clapp, North Grafton; Dr. J. O. Genereux, Webster; Dr. Albert G. Hurd, Millbury; Dr. W. L. Johnson, Uxbridge, vice-presidents; Dr. F. H. Washburn, Holden; Dr. F. H. Baker, Worcester; Dr. William J. Delahanty, Worcester; Dr. John T. Duggan, Worcester; Dr. Michael F. Fallon, Worcester; Dr. Homer Gage, Worcester; Dr. R. W. Greene, Worcester; Dr. David Harrower, Worcester; Dr. G. O. Ward, Worcester; Dr. S. B. Woodward, Worcester; Dr. C. D. Wheeler, Worcester; Dr. E. L. Hunt, Worcester. Councilor on Nominations: Dr. David Harrower, Dr. John T. Duggan, Alternate.

Censors: Dr. F. H. Washburn, Holden, supervisor; Dr. W. C. Seelye, Worcester; Dr. J. J. Cummings, Worcester; Dr. Alexander McNeish, Leicester; Dr. Andrew E. O'Connell, Worcester. Auditing Committee: Dr. A. W. Atwood, Worcester; Dr. Anna Murphy, Worcester; Dr. E. W. Barry, Whitinsville. Librarian: Dr. George C. Lincoln, Worcester; Dr. A. C. Getchell, pro tem. Library Committee: Dr. John F. Curran, Worcester; Dr. Peter A Colberg, Worcester; Dr. John A. MacFayden, Worcester.

Nominating Committee: Dr. P. H. Cook, Worcester, chairman; Dr. William F. Lynch, Worcester; Dr. G. F. H. Bowers, Worcester; Dr. M. B. Fox, Worcester; Dr. C. A. Sparrow, Worcester.

REVISED LIST OF PHYSICIANS FROM WORCESTER DISTRICT IN MILITARY SERVICE OF THE UNITED STATES OR THE ALLIES:

Medical Officers' Reserve Corps, United States Army, on active duty:

Beal, Howard, Worcester.
Bigelow, Edw. B., Worcester.
George, Frank W., Worcester.
Kinnicutt, Roger, Worcester.
Simmons, E. B., Worcester.
Denning, William E., Worcester.
Lemaire, Willard, Worcester.
Goodwin, James J., Clinton.
Beckley, Chester C., Lancaster.
Schofield, Roger, Worcester.
Lincoln, Merrick, Worcester.
Lincoln, George C., Worcester.
Phelan, E. F., North Brookfield.
Newton, R. S., Westboro.
Fay, William J., Worcester.
Yoosuf, A. K., Worcester.
*May, James V., Worcester.
Gwynne, Samuel C., Worcester.
Cahill, Harry P., Worcester.
Lurier, Israel, Worcester.
Gilfillan, Donald, Worcester.
O'Connor, D. F., Worcester.
Gage, Homer, Worcester.
Thom, D. A., Worcester.
Emerson, Kendall, Worcester.
Harriman, Frank E., Worcester.
Lewis, Elisha S., Princeton.
Ledbury, J. W., Uxbridge.
MacIntire, W. A., Worcester.

Oberg, Frank T., Worcester.
Simmons, H. I., Worcester.
Stapleton, Willard P., Worcester.
Watt, George, Worcester.

Commissioned but not yet called to active duty:

Little, George T., Uxbridge.
Salmon, Charles, Worcester.
Bridgewood, David, Worcester.
Berry, Gordon, Worcester.

**Staff Officer 104th Infantry:**

O'Connor, Joseph, Worcester.

United States Navy:

Haigh, Gilbert, Worcester.
Johnson, Linwood, Worcester.
Courtney, Thomas, Worcester.
Lannois, Joseph L., Northboro.
Adams, Winthrop, Worcester.

Massachusetts State Guard:

Shea, Peter O., Worcester.
Woodward, L. F., Worcester.
Sparrow, C. A., Worcester.
Ward, Roy J., Worcester.
Magune, Frank L., Worcester.
Bowers, George F. H., Worcester.
Mackay, Edw. H., Clinton.

English Army (Harvard Unit).

†Emerson, Kendall, Worcester.
Stansfield, Oliver, Worcester.
Bridges, Stanley, Worcester.
†Watt, George, Worcester.

English Hospitals:

Raymond, Albert O., Worcester.
MacKay, William H., Worcester.

United States Selection Service (Local Boards):

Austin, James C., Spencer.
Balmer, Edw. W., Whitinsville.
Barnes, J. Arthur, Worcester.
Bryant, Frederick, Worcester.
Harkins, John F., Worcester.
Hunt, Ernest L., Worcester.
McKibben, William W., Worcester.
McCrea, A. J., Southbridge.
Tobey, George L., Clinton.

Medical Advisory Board, District 15-A:

Baker, F. H., Worcester, *Chairman.*
Burley, B. T., Worcester, *Secretary.*
Wheeler, C. D., Worcester.
Harrower, David, Worcester.
Cook, Philip H., Worcester.
Delahanty, William J., Worcester.

District 15-B:

Watkins, R. P., Worcester, *Chairman.*
Cook, Philip H., Worcester, *Secretary.*
Miller, Lester C., Worcester.
Church, C. A., Millbury.
Estabrook, C. T., Worcester.
Mason, B. H., Worcester.

District 16.

French, C. L., Clinton, *Chairman.*
Morse, Irene M., Clinton, *Secretary.*
Scribner, E. V., Worcester.
Barton, J. A., Fitchburg.
Abbott, Charles R., Clinton.

Additional Examining Physicians (Advisory Boards):

Leland, L. P., Worcester.
Williams, F. R., Worcester.
Hartnett, Henry, Worcester.
O'Day, George F., Worcester.
Fox, M. B., Worcester.
Shannahan, R. J., Worcester.
Little, George T., Uxbridge.
Emery, George E., Worcester.
Ward, R. J., Worcester.
Rice, John E., Worcester.
Washburn, F. H., Holden.
Cooper, Edward, Worcester.
McClusky, Henry L., Worcester.
McSheehy, T. C., Worcester.
Power, George A., Worcester.
Dolan, William, Worcester.
Brown, George C., Worcester.
Kennedy, J. T., Worcester.
McDonald, J. W., Worcester.
Rochette, E. C., Worcester.
Cahill, J. W., Worcester.
Croissant, Charles, Worcester.
Wheeler, Alfred A., Leominster.
Chase, G. L., Clinton.
Currier, W. E., Leominster.
Shaughnessy, T. A., Leominster.
Brigham, Charles, Leominster.
Griswold, Merton L., Uxbridge.

Additional Examining Physicians (Local Boards):

Marsh, Arthur W., Worcester.
Hill, George H., Worcester.
Gilman, Warren R., Worcester.
Sparrow, C. A., Worcester.
Cross, Albert E., Worcester.

American Ambulance (Paris):

Clark, W. Irving, Worcester.

The Medical War Committee invites information to supplement or correct this list. Doctors joining the Colors should notify the Committee and indicate their wishes with regard to sharing the fees derived from their patients.

Ernest L. Hunt, *Secretary.*

* Honorably discharged. † Now in U. S. Army.

## Miscellany.

### CONVOCATION AND FOUR-DAY SCHOOL OF PUBLIC HEALTH.

Boston, May 28, 29, 30, 31, 1918.

The Convocation and Four-day School of Public Health will be held under the auspices of the Committee on Public Health of the Massachusetts Medical Society, with the endorsement and coöperation of the State Department of Health, the Massachusetts Association of Boards of Health and the United States Public Health Service.

PROGRAM.

Tuesday, May 28.

MORNING.

*Session on Water and Sewage Purification.*

At Huntington Hall, 491 Boylston Street, Boston.

9.05 "Purification of Water by Storage." M. C. Whipple, Instructor in Sanitary Chemistry, Harvard University.

10.05 "The Control of Water Supplies." Harry W. Clark, Director and Chemist of the Division of Water and Sewage Laboratories, State Department of Health.

11.05 "Sewage Disposal for Residences." Prof. Robert Spurr Weston of Messrs. Weston & Sampson, Consulting Sanitary Engineers, and formerly Assistant Professor of Public Health Engineering, M. I. T. *Stereopticon.*

12.00 Addresses of welcome from: Dr. Enos H. Bigelow, Chairman of the Committee on Public Health of the Massachusetts Medical Society; Dr. Samuel B. Woodward, President of the Massachusetts Medical Society; Dr. Eugene R. Kelley, State Commissioner of Health; His Honor, Andrew J. Peters, Mayor of the City of Boston, and His Excellency, Hon. Samuel W. McCall, Governor of the Commonwealth. These addresses will be followed by a roll-call of cities and towns represented.

AFTERNOON.

*Session on Public Health Laboratory Methods.*

At Huntington Hall, 491 Boylston Street, Boston.

2.05 "The Present Status of Pneumococcus Type Determination." Miss Edith A. Beckler, S. B., Bacteriologist, State Department of Health.

3.05 "The Development of a Public Health Laboratory." Dr. F. H. Slack, Instructor, Department of Biology and Public Health, M. I. T., and formerly Bacteriologist to the Board of Health of Boston.

4.00 There will be an opportunity for persons engaged in laboratory work to visit either the State or the City Diagnostic Laboratory.

WEDNESDAY, MAY 29.

MORNING.

*Session on Public Health Reports.*

At the Massachusetts Institute of Technology, Cambridge, Room 10-250.

9.05 "Statistical Arithmetic." Prof. G. C. Whipple, Professor of Sanitary Engineering at Harvard University and the M. I. T.

10.05 "Graphic Methods in Public Health Work." Dr. J. P. Bill, Department of Preventive Medicine and Hygiene, Harvard Medical School. *Stereopticon.*

11.05 "How to Keep Posted on Public Health Progress." John Ritchie, Jr., formerly Health Commissioner, City of Boston.

12.05 "The Annual Report." A. W. Hedrich, Secretary, American Public Health Association.

AFTERNOON.

*Session on Specific Diseases.*

At Massachusetts Institute of Technology, Cambridge, Room 10-250.

2.05 "The Control of Venereal Diseases." Dr. John S. Hitchcock, Director, Division of Communicable Diseases, State Department of Health.

3.05 "The Relation of Feeble-mindedness to Public Health." Dr. Walter E. Fernald, Superintendent, Massachusetts School for Feebleminded.

4.05 "Present Needs in the Tuberculosis Campaign." Dr. John B. Hawes, 2d, Secretary, Trustees of State Hospitals for Consumptives. *Stereopticon.*

THURSDAY, MAY 30.

AFTERNOON.

*Session on Industrial Hygiene and Sanitation.*

At Massachusetts Institute of Technology, Cambridge, Room 10-250

2.05 "Diet and the Health of the Worker." Dr. Percy G. Stiles, Assistant Professor of Physiology, Harvard University.

3.05 "The United States Public Health Service and the Sanitation of War Industries." Passed Assistant Surgeon A. J. Lanza, United States Public Health Service, Washington, D. C.

4.05 "Industrial Health." Dr. David L. Edsall, Jackson Professor of Clinical Medicine, Harvard Medical School, and Member of Public Health Council, State Department of Health.

EVENING.

At Massachusetts Institute of Technology, Cambridge, Room 10-250.

7.30 "Methods Employed in Public Health Education in China." Dr. W. W. Peter, Secretary, Joint Council on Public Health Education, Shanghai, China. A lecture, richly illustrated, to be followed by a social hour. Ladies especially invited.

FRIDAY, MAY 31.

MORNING.

*Session on Child Welfare.*

At Huntington Hall, 491 Boylston Street, Boston.

9.05 "Dental Hygiene, the Prevention of Children's Diseases Through Supervised Care of the Mouth." Dr. George H. Wright, Lecturer on Dental Hygiene, Harvard Dental School.

10.05 "Ten-Years' School Nursing in the Boston Public Schools." Miss Helen F. McCaffrey, Supervising Nurse, Boston School Department.

11.05 "The Plan and Work of the Committee on Child Conservation of the State Department of Health." Dr. Richard M. Smith, Secretary of the Committee.

12.05 "Child Welfare in War Time." Dr. Dorothy Reed Mendenhall of the Division of Hygiene, Children's Bureau, U. S. Department of Labor, Washington, D. C., and Lecturer on Health, Agricultural Extension, University of Wisconsin.

AFTERNOON.

*Session on Public Health Administration.*

At Huntington Hall, 491 Boylston Street, Boston.

2.05 "The Work of the Public Health Nurse." Miss Anne H. Strong, R.N., Assistant Professor of Public Health Nursing, Simmons College. *Stereopticon.*

3.05 "Public Health Administration in Rural Districts." Dr. L. D. Bristol, M.D., Dr. P.H., State Commissioner of Health of Maine, formerly Special Agent, Massachusetts State Department of Health Investigating Infant Paralysis.

4.05 "Essential Activities of a Board of Health." Dr. Lyman A. Jones, Director of the Division of Hygiene, State Department of Health.

### *Time of Lectures.*

All lectures will begin *promptly* at five minutes after the hour, and those attending are asked to be in their seats before this time, in order to avoid disturbing the speaker and the audience. In general, lectures will close at forty-five minutes after the hour and ten minutes given to a round table discussion in charge of the speaker. Listeners are urged to bring up practical questions for discussion at that time. In all cases, ten minutes' intermission will be allowed between lectures.

### *Welcome.*

Not only Public Health Officials of the State of Massachusetts, but all persons professionally interested in public health and allied activities will be welcome at these sessions.

### *Place of Meetings.*

The sessions of Tuesday, May 28, and Friday, May 31, will be held in Huntington Hall, Rogers Building, at 491 Boylston Street, Boston.

The sessions of Wednesday, May 29, and Thursday, May 30, will be held in Room 10-250 at the new Technology buildings in Cambridge. This room is on the second floor in the central building, directly under the dome. To reach the new Technology buildings from Park Street or South Station, take the Cambridge Subway to Central Square, transferring there to a Dudley Street car. Leave this car at Bexley Hall and enter the Technology building from the side.

### *Information.*

Further information may be secured by writing or telephoning to the agent of The Public Health Committee, C. E. Turner, M.A., 69 Massachusetts Avenue, Cambridge. Telephone Cambridge 6900.